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VOLUME 2

Technical Appendixes

Removal Site Assessment Report

Reynolds Metals Company
TROUTDALE FACILITY
OPERABLE UNIT 1

CH2M HILL

JANUARY 1995

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Contents

Appendix A

Soil and Groundwater Tracking Data Tables

Soil Tracking Data Tables

Soil Tracking Data

Matrix	Sample ID	Collection Date	Add. Anal. Date	Beg depth	End depth	Lab #	Lab Results In (a)	Cyanide-Total	Fluoride	Hardness	Metals-13(PP)	Metals-23(CLP)	Metals-Dissolved	PAH	TPAH-S	PCB	PCB-S	Pesticides-Chlor.	TCLP	TOC	TPH	TPH 418_1	TPH-1l glass	TPH-S	TPH-VOA bottle
	North Landfill East Area																								
S	E-H-W1	6/20/94		0	0	94-1672	F									X			X						
S	E-H-W2	6/20/94		0	0	94-1672	F									X			X						
S	E-H-W3	6/20/94		0	0	94-1672	F									X			X						
S	E-H-W4A	6/20/94		0	0	94-1672	F														X				
S	E-H-W5	6/20/94		0	0	94-1672	F									X			X						
S	S-H-N3A	6/20/94		0	0	94-1672	F														X				
	North Landfill West Area																								
S	EHW1-C	7/20/94		0	0	94-2017	F	X	X		X				X		X								
S	EHW1-C	7/20/94	8/1/94	0	0	94-2017	F									X									
S	EHW1-S	7/20/94	8/1/94	0	0	94-2017	F										X								
S	EHW1-2	7/20/94	8/1/94	2	2	94-2017	F										X								
S	EHW1-5	7/20/94	8/1/94	5	5	942017	F										X								
S	EHW2-C	7/20/94		0	0	94-2017	F	X	X		X				X		X								
S	EHW2-C	7/20/94	8/1/94	0	0	94-2017	F									X									
S	EHW2-S	7/20/94	8/1/94	0	0	94-2017	F										X								
S	EHW2-2	7/20/94	8/1/94	2	2	94-2017	F										X								
S	EHW2-5.5	7/20/94	8/1/94	5.5	5.5	94-2017	F										X								
S	EHW3-C	7/19/94		0	0	94-2007	F	X	X		X				X		X								
S	SHN1-C	7/20/94		0	0	94-2017	F	X	X		X				X		X								
S	SHN2-C	7/20/94		0	0	94-2017	F	X	X		X				X		X								
S	SHN3-C	7/20/94		0	0	94-2017	F	X	X		X				X		X								
S	SHN4-C	7/18/94		0	0	94-2007	F	X	X		X				X		X								
	South Potliner																								
S	SP1-C	7/20/94	8/1/94	0	0	94-2017	F															X			
S	SP1-C	7/20/94		0	0	94-2017	F	X	X						X		X								
S	SP2-C	7/20/94	8/1/94	0	0	94-2032	F							X											
S	SP2-C	7/20/94		0	0	94-2032	F	X	X		X				X		X								
S	SP2-2.5	7/20/94	8/1/94	2.5	2.5	94-2032	F								X										
S	SP2-5.0	7/20/94	8/1/94	5	5	94-2032	F								X										
S	SP3-C	7/21/94		0	0	94-2032	F	X	X		X				X		X								
S	SP3-CD	7/21/94		0	0	94-2032	F	X	X		X				X		X								
S	SP4-C	7/21/94		0	0	94-2032	F	X	X		X				X		X								
S	SP4-C	7/21/94	8/1/94	0	0	94-2032	F							X											
S	SP4-3.0	7/21/94	8/1/94	3	3	94-2032	F								X										
S	SP5-C	7/21/94		0	0	94-2032	F	X	X		X				X		X								
S	SP5-3.0	7/21/94	8/1/94	3	3	94-2032	F								X										
S	SP6-C	7/21/94		0	0	94-2032	F	X	X		X				X		X								
S	SP6-CD	7/21/94		0	0	94-2032	F	X	X		X				X		X								
S	SP6-CD	7/21/94	8/1/94	0	0	94-2032	F							X											
S	SP6-3.0	7/21/94	8/1/94	3	3	94-2032	F								X										
S	SP7-C	7/21/94		0	0	94-2032	F	X	X		X				X		X								
S	SP7-2.5	7/21/94	8/1/94	2.5	2.5	94-2032	F								X										
S	SP8-C	7/21/94		0	0	94-2032	F	X	X		X				X		X								
S	SP8-2.5	7/21/94	8/1/94	2.5	2.5	94-2032	F								X										
S	SP9-C	7/21/94		0	0	94-2032	F	X	X		X				X		X								
S	SP9-2.5	7/21/94	8/1/94	2.5	2.5	94-2032	F								X		X								
S	SP9-5.0	7/21/94	8/1/94	5	5	94-2032	F								X		X								
S	SP10-C	7/21/94		0	0	94-2032	F	X	X		X				X		X								
S	SP10-C	7/21/94	8/1/94	0	0	94-2032	F							X		X									
S	SP10-4.0	7/21/94	8/1/94	4	4	94-2032	F								X		X								
S	SP11-C	7/21/94		0	0	94-2032	F	X	X		X				X		X								

Soil Tracking Data

Matrix	Sample ID	Collection Date	Add. Anal. Date	Beg depth	End depth	Lab #	Lab Results In (a)	Cyanide-Total	Fluoride	Hardness	Metals-13(PP)	Metals-23(CLP)	Metals-Dissolved	PAH	TPAH-S	PCB	PCB-S	Pesticides-Chlor.	TCLP	TOC	TPH	TPH 418_1	TPH-1l glass	TPH-S	TPH-VOA bottle
	Additional South Potliner																								
S	B2-2	9/13/94	9/15/94	2	2	94-2643	F							X	X										
S	B2-4	9/13/94	9/15/94	4	4	94-2643	F							X	X	X	X								
S	B2-6	9/13/94		6	6	94-2643	F							X		X									
S	B2-6	9/13/94	9/15/94	6	6	94-2643	F								X		X								
S	B2-C	9/13/94		0	0	94-2643	F	X	X		X				X		X								
S	B2-C	9/13/94	9/15/94	0	0	94-2643	F							X											
S	C1.5-C	9/13/94		0	0	94-2643	F	X	X		X				X		X								
S	C1.5-C	9/13/94	9/15/94	0	0	94-2643	F							X											
S	C1-5.6	9/13/94		6	6	94-2643	F							X		X									
S	C1-5.6	9/13/94	9/15/94	6	6	94-2643	F								X		X								
S	D4-6	9/13/94		6	6	94-2643	F							X		X									
S	D4-6	9/13/94	9/15/94	6	6	94-2643	F								X		X								
S	D4-8	9/13/94		8	8	94-2643	F							X											
S	D4-8	9/13/94		8	8	94-2643	F									X									
S	D4-8	9/13/94	9/15/94	8	8	94-2643	F								X		X								
S	D4-C	9/13/94		0	0	94-2643	F	X	X		X				X		X								
S	D4-C	9/13/94	9/15/94	0	0	94-2643	F							X											
S	E2-C	9/13/94		0	0	94-2643	F	X	X		X				X		X								
S	E2-C	9/13/94	9/15/94	0	0	94-2643	F							X											
S	E5-C	9/13/94		0	0	94-2643	F	X	X		X				X		X								
S	E5-C	9/13/94	9/15/94	0	0	94-2643	F							X											
	East Potliner																								
S	EP1-S	7/22/94	9/27/94	0	0	94-2047	F										X								
S	EP2-S	7/22/94	9/27/94	0	0	94-2047	F										X								
S	EP3-S	7/22/94	9/27/94	0	0	94-2047	F										X								
S	EP4-S	7/22/94	9/27/94	0	0	94-2047	F										X								
S	EP5-S	7/22/94	9/27/94	0	0	94-2047	F										X								
S	EP6-S	7/22/94	9/27/94	0	0	94-2047	F										X								
S	EP7-S	7/22/94	9/27/94	0	0	94-2047	F										X								
S	EP8-S	7/22/94	9/27/94	0	0	94-2047	F										X								
S	EP1-C	7/22/94		0	0	94-2047	F	X	X						X										
S	EP2-C	7/22/94		0	0	94-2047	F	X	X						X										
S	EP2-CD	7/22/94		0	0	94-2047	F	X	X						X										
S	EP3-C	7/22/94		0	0	94-2047	F	X	X						X										
S	EP4-C	7/22/94		0	0	94-2047	F	X	X						X										
S	EP5-C	7/22/94		0	0	94-2047	F	X	X						X										
S	EP6-C	7/22/94		0	0	94-2047	F	X	X						X										
S	EP7-C	7/22/94		0	0	94-2047	F	X	X						X										
S	EP8-C	7/22/94		0	0	94-2047	F	X	X						X										
	Cryolite Ponds																								
S	CP1-C	7/25/94		0	0	94-2060	F	X							X		X								
S	CP1-5.0	7/25/94	9/9/94	5	5	94-2060	F		X																
S	CP1-C	7/25/94	9/9/94	0	0	94-2060	F				X														
S	CP2-C	7/25/94		0	0	94-2060	F	X							X		X								
S	CP2-C	7/25/94	9/9/94	0	0	94-2060	F				X														
S	CP2-10.5	7/25/94		10.5	10.5	94-2060	F	X							X		X								
S	CP3-S	7/25/94	8/3/94	0	0	94-2060	F	X	X						X		X								
S	CP3-S	7/25/94	9/9/94	0	0	94-2060	F		X																
S	CP3-1.2	7/25/94	8/3/94	1.2	1.2	94-2060	F	X							X		X								
S	CP3-1.2	7/25/94	9/9/94	1.2	1.2	94-2060	F		X		X														
S	CP4-S	7/25/94	8/3/94	0	0	94-2060	F	X							X		X								
S	CP4-S	7/25/94	9/9/94	0	0	94-2060	F		X																
S	CP4-2.5	7/25/94	8/3/94	2.5	2.5	94-2060	F	X							X		X								
S	CP4-2.5	7/25/94	9/9/94	2.5	2.5	94-2060	F		X		X														

Soil Tracking Data

Matrix	Sample ID	Collection Date	Add. Anal. Date	Beg depth	End depth	Lab #	Lab Results In (a)	Cyanide-Total	Fluoride	Hardness	Metals-13(PP)	Metals-23(CLP)	Metals-Dissolved	PAH	TPAH-S	PCB	PCB-S	Pesticides-Chlor.	TCLP	TOC	TPH	TPH 418_1	TPH-1l glass	TPH-S	TPH-VOA bottle
S	CP5-C	7/28/94		0	0	94-2101	F	X	X						X		X								
S	CP5-C	7/28/94	9/9/94	0	0	94-2101	F				X														
S	CP5-3.0	7/28/94	9/9/94	3	3	94-2101	F		X																
S	CP6-C	7/28/94		0	0	94-2101	F	X	X						X		X								
S	CP6-C	7/28/94	9/9/94	0	0	94-2101	F				X														
S	CP6-3.0	7/28/94	9/9/94	3	3	94-2101	F		X																
	Parking Lot																								
S	P1-1-3	7/25/94		1	3	94-2060	F	X							X		X								
S	P1-3-5	7/25/94		3	5	94-2060	F	X							X		X								
S	P1-5-7	7/25/94		5	7	94-2060	F	X							X		X								
S	P2-1-3	7/25/94		1	3	94-2060	F	X							X		X								
S	P2-3-5	7/25/94		3	5	94-2060	F	X							X		X								
S	P2-5-7	7/25/94		5	7	94-2060	F	X							X		X								
S	P3-1-3	7/25/94		1	3	94-2060	F	X							X		X								
S	P3-3-5	7/25/94		3	5	94-2060	F	X							X		X								
S	P3-5-7	7/25/94		5	7	94-2060	F	X							X		X								
S	P4-1-3	7/25/94		1	3	94-2060	F	X							X		X								
S	P4-3-5	7/25/94		3	5	94-2060	F	X							X		X								
S	P4-5-7	7/25/94		5	7	94-2060	F	X							X		X								
	South Wetlands																								
S	SW1-C	7/26/94		0	0	94-2070	F	X	X						X		X	X							
S	SW1-C	7/26/94	8/1/94	0	0	94-2070	F																	X	
S	SW1-C	7/26/94	9/9/94	0	0	94-2070	F				X														
S	SW2-C	7/26/94		0	0	94-2070	F	X	X						X		X	X							
S	SW2-C	7/26/94	8/1/94	0	0	94-2070	F															X			
S	SW2-C	7/26/94	9/9/94	0	0	94-2070	F				X														
S	SW3-C	7/26/94		0	0	94-2070	F	X	X						X		X	X							
S	SW3-C	7/26/94	8/1/94	0	0	94-2070	F																	X	
S	SW3-C	7/26/94	9/9/94	0	0	94-2070	F				X														
S	SW4-C	7/25/94		0	0	94-2070	F	X	X						X		X	X							
S	SW4-C	7/25/94	8/1/94	0	0	94-2070	F																	X	
S	SW4-C	7/25/94	9/9/94	0	0	94-2070	F				X														
S	SW5-C	7/25/94		0	0	94-2070	F	X	X						X		X	X							
S	SW5-C	7/26/94	9/9/94	0	0	94-2070	F				X														
	Scrap Yard																								
S	SY1-C	7/25/94		0	0	94-2060	F								X										
S	SY1-C	7/25/94	8/1/94	0	0	94-2060	F	X	X					X			X								
S	SY1-2.0	7/25/94	8/1/94	2	2	94-2060	F								X										
S	SY1-4.0	7/25/94	8/1/94	4	4	94-2060	F								X										
S	SY2-C	7/25/94		0	0	94-2060	F								X										
S	SY2-C	7/25/94	8/1/94	0	0	94-2060	F										X								
S	SY2-C	7/25/94	8/1/94	0	0	94-2060	F	X	X																
S	SY2-2.0	7/25/94	8/1/94	2	2	94-2060	F								X										
S	SY2-4.0	7/25/94	8/1/94	4	4	94-2060	F								X										
S	SY3-C	7/25/94		0	0	94-2060	F	X	X						X		X								
S	SY3-C	7/25/94	8/1/94	0	0	94-2060	F				X														
S	SY4-C	7/26/94		0	0	94-2070	F								X										
S	SY4-C	7/26/94	8/1/94	0	0	94-2070	F	X	X								X								
S	SY5-C	7/26/94		0	0	94-2070	F				X				X										
S	SY5-C	7/26/94	8/1/94	0	0	94-2070	F	X	X								X								
S	SY6-S	7/26/94		0	0	94-2070	F								X										
S	SY6-S	7/26/94	8/1/94	0	0	94-2070	F	X	X								X								
S	SY7-S	7/26/94		0	0	94-2070	F								X										
S	SY7-S	7/26/94		0	0	94-2070	F	X	X																
S	SY7-S	7/26/94	8/1/94	0	0	94-2070	F										X								

Soil Tracking Data

Matrix	Sample ID	Collection Date	Add. Anal. Date	Beg depth	End depth	Lab #	Lab Results In (a)	Cyanide-Total	Fluoride	Hardness	Metals-13(PP)	Metals-23(CLP)	Metals-Dissolved	PAH	TPAH-S	PCB	PCB-S	Pesticides-Chlor.	TCLP	TOC	TPH	TPH 418_1	TPH-1l glass	TPH-S	TPH-VOA bottle
S	SY8-C	7/26/94		0	0	94-2070	F				X				X										
S	SY8-C	7/26/94	8/1/94	0	0	94-2070	F										X								
S	SY8-C	7/26/94	8/1/94	0	0	94-2070	F	X	X																
S	SY9-C	7/26/94		0	0	94-2070	F								X										
S	SY9-C	7/26/94	8/1/94	0	0	94-2070	F	X	X								X								
S	SY10-C	7/26/94		0	0	94-2070	F								X										
S	SY10-C	7/26/94	8/1/94	0	0	94-2070	F	X	X								X								
S	SY11-C	7/26/94		0	0	94-2070	F								X										
S	SY11-C	7/26/94	8/1/94	0	0	94-2070	F	X	X								X								
S	SY12-C	7/25/94		0	0	94-2060	F								X										
S	SY12-C	7/25/94	8/1/94	0	0	94-2060	F	X	X						X		X								
S	SY13-C	7/25/94		0	0	94-2060	F								X										
S	SY13-C	7/25/94	8/1/94	0	0	94-2060	F	X	X								X								
S	SY14-C	7/25/94		0	0	94-2060	F								X										
S	SY14-C	7/25/94	8/1/94	0	0	94-2060	F	X	X					X			X								
S	SY14-2.0	7/25/94	8/1/94	2	2	94-2060	F								X										
S	SY14-4.0	7/25/94	8/1/94	4	4	94-2060	F								X										
S	SY15-C	7/25/94		0	0	94-2060	F								X										
S	SY15-C	7/25/94	8/1/94	0	0	94-2060	F	X	X								X								
	Reconnaissance																								
S	ND-1-S	8/4/94		0	0	94-2178	F	X							X										
S	ND-2-S	8/4/94		0	0	94-2178	F	X							X										
S	OR-1-S	8/4/94		0	0	94-2178	F	X							X										
S	SPWP-B	8/26/94		0	0	94-2441	F	X	X		X			X	X	X	X								
S	SPWP-A	8/26/94		0	0	94-2441	F	X	X		X			X	X	X	X								
S	SW-6-S	8/4/94		0	0	94-2178	F	X	X						X										
	West Field																								
S	WF1-2.0	9/23/94		2	2	94-2808	F	X	X																
S	WF2-2.0	9/23/94		2	2	94-2808	F	X	X																
S	WF3-2.0	9/23/94		2	2	94-2808	F	X	X																
	Sediment																								
SD	RM-SD1	8/18/94		0	0	94-2359	F	X	X			X		X		X				X				X	
SD	RM-SD2	8/18/94		0	0	94-2359	F	X	X			X		X		X				X				X	
SD	RM-SD3	8/18/94		0	0	94-2359	F	X	X			X		X		X				X				X	
SD	RM-SD4	8/18/94		0	0	94-2359	F	X	X			X		X		X				X				X	
SD	RM-SD5	8/19/94	8/19/94	0	0	94-2373	F	X	X			X		X		X				X				X	
SD	RM-SD5D	8/19/94	8/19/94	0	0	94-2373	F	X	X			X		X		X				X				X	
SD	RM-SD6	8/19/94	8/19/94	0	0	94-2373	F	X	X			X		X		X				X				X	
SD	RM-SD7	8/19/94	8/19/94	0	0	94-2373	F	X	X			X		X		X				X				X	
SD	RM-SD8	8/19/94	8/19/94	0	0	94-2373	F	X	X			X		X		X				X				X	
SD	RM-SD9	8/19/94	8/19/94	0	0	94-2373	F	X	X			X		X		X				X				X	
SD	RM-SD10	8/19/94	8/19/94	0	0	94-2373	F	X	X			X		X		X				X				X	
SD	RM-SD11	8/19/94	8/19/94	0	0	94-2373	F	X	X			X		X		X				X				X	
SD	RM-SD12	8/18/94		0	0	94-2359	F	X	X			X		X		X				X				X	
SD	RM-SD13	8/18/94		0	0	94-2359	F	X	X			X		X		X				X				X	
SD	RM-SD14	8/18/94		0	0	94-2359	F	X	X			X		X		X				X				X	
SD	RM-SD14D	8/18/94		0	0	94-2359	F	X	X			X		X		X				X				X	
SD	RM-S15	8/18/94		0	0	94-2359	F	X	X			X		X		X				X				X	
SD	RM-S16	8/18/94		0	0	94-2359	F	X	X			X		X		X				X				X	
SD	RM-S17	8/18/94		0	0	94-2359	F	X	X			X		X		X				X				X	
SD	RM-SD18	8/19/94	8/19/94	0	0	94-2373	F	X	X			X		X		X				X				X	

Soil Tracking Data

Matrix	Sample ID	Collection Date	Add. Anal. Date	Beg depth	End depth	Lab #	Lab Results In (a)	Cyanide-Total	Fluoride	Hardness	Metals-13(PP)	Metals-23(CLP)	Metals-Dissolved	PAH	TPAH-S	PCB	PCB-S	Pesticides-Chlor.	TCLP	TOC	TPH	TPH 418_1	TPH-1l glass	TPH-S	TPH-VOA bottle
	Surface Water																								
SW	RM-SW1	8/18/94		0	0	94-2360	F	X	X	X		X		X		X								X	
SW	RM-SW3	8/18/94		0	0	94-2360	F	X	X	X		X		X		X								X	
SW	RM-SW5	8/19/94		0	0	94-2374	F	X	X	X		X		X		X								X	
SW	RM-SW6	8/19/94		0	0	94-2374	F	X	X	X		X		X		X								X	
SW	RM-SW10	8/19/94		0	0	94-2374	F	X	X	X		X		X		X								X	
SW	RM-SW11	8/18/94		0	0	94-2360	F	X	X	X		X		X		X								X	
SW	RM-SW14	8/18/94		0	0	94-2360	F	X	X	X		X		X		X								X	
SW	RM-SW14D	8/18/94		0	0	94-2360	F	X	X	X		X		X		X								X	
SW	RM-SW18	8/19/94		0	0	94-2374	F	X	X	X		X		X		X								X	
	Miscellaneous Area																								
	Stressed Area																								
S	SP5-SA1-C	7/26/94	9/9/94	0	0	94-2070	F	X	X		X				X		X	X							
S	SP5-SA2-C	7/26/94		0	0	94-2070	F	X	X						X		X	X							
S	SP5-SA2-C	7/26/94	9/9/94	0	0	94-2070	F				X														
	Notes:																								
	(a) F = Final results																								

Groundwater Tracking Data Tables

Appendix B
Soil and Test Pit Logs

Groundwater Tracking Data

Matrix	Station ID	Sample ID	Collection Date	Add. Anal. Date	Beg depth	End depth	Lab #	Lab Results In (a)	Aluminum	Arsenic	Cyanide-Amen.	Cyanide-Total	Fluoride	Metals-23(CLP)	Metals-Dis.	PAH	TPAH-S	PCB	PCB-S	Pesticide-Chlor.	SVOC	TPH	TPH-S	VOC
		Bake House Sump and Drill Rig Samples																						
GW	BS-11	RM-BS11	08/25/94		0	0	94-2433	F			X	X	X	X		X					X		X	
GW	BS-16	RM-BS16	08/25/94		0	0	94-2433	F	X	X		X	X			X					X		X	
GW	BS-18	RM-BS18	08/25/94		0	0	94-2433	F	X	X	X	X	X			X					X		X	
GW	BS-21	RM-BS21	08/25/94		0	0	94-2433	F	X	X		X	X			X					X		X	
GW	BW-13	RM-BWP3-82594	08/25/94		0	0	94-2433	F	X	X		X	X			X					X		X	
GW	DRILLRIG	RM-DRILLRIG	07/09/94		0	0	94-1899	F				X	X	X					X					
GW	DRILLRIG	RM-DRILLRIG	07/09/94		0	0	94-1899	F									X						X	
		Offsite Wells																						
GW	FF-01	RM-FF1-9694	09/06/94		0	0	94-2541	F				X	X					X			X			
GW	GS-01	RM-GS1-9694	09/06/94		0	0	94-2541	F				X	X					X			X			
GW	SM-01	RM-SM1-9694	09/06/94		0	0	94-2541	F				X	X					X			X			
		Monitoring Well Groundwater Samples																						
GW	MW-01	RM-MW-01-EB	07/12/94		0	0	94-1926	F				X	X	X			X		X					X	
GW	MW-01	RM-MW01-7-94	07/18/94		0	0	94-2000	F			X	X	X	X		X		X				X		
GW	MW-01	RM-MW01-81594	08/15/94		0	0	94-2305	F			X	X	X											
GW	MW-02	RM-MW02-7-94	07/18/94		0	0	94-2000	F				X	X	X		X		X					X	
GW	MW-02	RM-MW02-81594	08/15/94		0	0	94-2305	F				X	X			X								
GW	MW-02D	RM-MW22-7-94	07/18/94		0	0	94-2000	F				X	X	X		X		X					X	
GW	MW-02EB	RM-MW32-81594	08/15/94		0	0	94-2305	F				X	X	X		X		X		X			X	
GW	MW-02EB	RM-MW32-81594	08/15/94		0	0	94-2323	F																X
GW	MW-03	RM-MW03-7-94	07/18/94		0	0	94-2000	F			X	X	X	X		X		X				X	X	
GW	MW-03EB	RM-MW-33-7-94	07/18/94		0	0	94-2000	F				X	X	X		X		X				X	X	
GW	MW-04	RM-MW-04-81594	08/15/94		0	0	94-2305	F			X	X	X	X	X									
GW	MW-04	RM-MW-04-7/18	07/18/94				94-2000	F			X	X	X	X	X	X		X				X		
GW	MW-05	RM-MW05-7-94	07/18/94		0	0	94-2000	F				X	X	X		X		X					X	
GW	MW-05	BPA-MW5-81694	08/16/94		0	0	94-2323	F				X	X	X		X		X		X	X			X
GW	MW-06	RM-MW-06-7/18	07/18/94				94-2000	F				X	X	X		X	X	X					X	
GW	MW-07	RM-MW-07-EB	07/09/94		0	0	94-1899	F				X	X	X			X		X				X	
GW	MW-07	RM-MW-07-7/18	07/18/94				94-2000	F				X	X	X		X	X	X					X	
GW	MW-08	RM-MW08-81594	08/15/94		0	0	94-2305	F				X	X											
GW	MW-08	RM-MW-08-7/18	07/18/94				94-2000	F				X	X	X		X	X	X					X	
GW	MW-09	RM-MW09-81594	08/15/94		0	0	94-2305	F			X	X	X	X		X		X		X	X		X	

Groundwater Tracking Data

Matrix	Station ID	Sample ID	Collection Date	Add. Anal. Date	Beg depth	End depth	Lab #	Lab Results In (a)	Aluminum	Arsenic	Cyanide-Amen.	Cyanide-Total	Fluoride	Metals-23(CLP)	Metals-Dis.	PAH	TPAH-S	PCB	PCB-S	Pesticide-Chlor.	SVOC	TPH	TPH-S	VOC
GW	MW-09	RM-MW09-81594	08/15/94		0	0	94-2323	F																X
GW	MW-09D	RM-MW29-81594	08/15/94		0	0	94-2305	F			X	X	X	X		X		X		X	X		X	
GW	MW-09D	RM-MW29-81594	08/15/94		0	0	94-2323	F																X
GW	MW-10	RM-MW-10-81594	08/15/94		0	0	94-2305	F				X	X	X	X	X		X		X	X		X	
GW	MW-10	RM-MW-10-81594	08/15/94		0	0	94-2323	F																X
GW	MW-10EB	RM-MW10-2.5EB	08/05/94		2.5	2.5	94-2202	F				X	X	X			X		X				X	
GW	MW-11	RM-MW11-81594	08/15/94		0	0	94-2305	F			X	X	X	X	X	X		X		X	X		X	
GW	MW-11	RM-MW11-81594	08/15/94		0	0	94-2323	F																X
GW	MW-11EB	RM-MW11-2.5EB	08/04/94		2.5	2.5	94-2202	F				X	X	X			X		X				X	
GW	MW-12	RM-MW12-81594	08/15/94		0	0	94-2305	F				X	X	X		X		X		X	X		X	
GW	MW-12	RM-MW12-81594	08/15/94		0	0	94-2323	F																X
		Production Wells																						
GW	PW-03	RM-PW03-81694	08/16/94		0	0	94-2323	F				X	X	X		X		X		X	X		X	X
GW	PW-07	RM-PW07-81694	08/16/94		0	0	94-2323	F				X	X	X		X		X		X	X		X	X
GW	PW-08	RM-PW08-81594	08/16/94		0	0	94-2323	F				X	X	X		X		X		X	X		X	X
GW	PW-10	RM-PW10-81694	08/16/94		0	0	94-2323	F				X	X	X		X		X		X	X	X	X	X
GW	PW-18	RM-PW18-81694	08/16/94		0	0	94-2323	F			X	X	X	X		X		X		X	X		X	X
GW	PW-18	RM-PW18TB	08/16/94		0	0	94-2323	F																X
GW	PW-18D	RM-PW28-81694	08/16/94		0	0	94-2323	F			X	X	X	X		X		X		X	X		X	X
		Soil Boring Samples																						
SB	MW-01	RM-MW-01-S	07/12/94		0	0	94-1926	F				X	X	X		X	X	X	X			X	X	
SB	MW-01	RM-MW-01-2.5	07/12/94		2.5	2.5	94-1926	F				X	X	X			X		X				X	
SB	MW-01	RM-MW-01-7.5	07/12/94		7.5	7.5	94-1926	F				X	X			X	X	X	X			X	X	
SB	MW-01	RM-MW01-10	07/12/94		10	10	94-1926	F									X							
SB	MW-01	RM-MW01-12.5	07/12/94		12.5	12.5	94-1926	F									X							
SB	MW-01D	RM-MW-01-SD	07/12/94		0	0	94-1926	F				X	X	X			X		X				X	
SB	MW-02	RM-MW-02-S	07/11/94		0	0	94-1913	F				X	X	X			X		X				X	
SB	MW-02	RM-MW-02-2.5	07/11/94		2.5	2.5	94-1913	F				X	X	X			X		X				X	
SB	MW-02	RM-MW-02-7.5	07/11/94		7.5	7.5	94-1913	F				X	X				X		X				X	
SB	MW-02	RM-MW-02-12.5	07/11/94		12.5	12.5	94-1913	F				X	X				X		X				X	
SB	MW-03	RM-MW-03-S	07/09/94		0	0	94-1899	F				X	X				X		X				X	
SB	MW-03	RM-MW-03-2.5'	07/09/94		2.5	2.5	94-1899	F				X	X				X		X				X	
SB	MW-04	RM-MW-04-S	07/12/94		0	0	94-1926	F				X	X	X		X	X	X	X			X	X	

Groundwater Tracking Data

Matrix	Station ID	Sample ID	Collection Date	Add. Anal. Date	Beg depth	End depth	Lab #	Lab Results In (a)	Aluminum	Arsenic	Cyanide-Amen.	Cyanide-Total	Fluoride	Metals-23(CLP)	Metals-Dis.	PAH	TPAH-S	PCB	PCB-S	Pesticide-Chlor.	SVOC	TPH	TPH-S	VOC
SB	MW-04	RM-MW-04-2.5	07/12/94		2.5	2.5	94-1926	F				X	X	X			X		X				X	
SB	MW-04	RM-MW-04-7.5	07/12/94		7.5	7.5	94-1926	F				X	X				X		X				X	
SB	MW-04	RM-MW-04-10.0	07/12/94		10	10	94-1926	F				X	X				X		X				X	
SB	MW-05	RM-MW-05-2.5	07/08/94		2.5	2.5	94-1895	F				X	X				X		X				X	
SB	MW-06	RM-MW-06-S	07/08/94		0	0	94-1895	F				X	X	X			X		X				X	
SB	MW-06	RM-MW-06-2.5	07/08/94		2.5	2.5	94-1895	F				X	X	X			X		X				X	
SB	MW-06	RM-MW-06-7.5	07/08/94		7.5	7.5	94-1895	F				X	X				X		X				X	
SB	MW-07	RM-MW-07-S	07/09/94		0	0	94-1899	F				X	X				X		X				X	
SB	MW-07	RM-MW-07-2.5'	07/09/94		2.5	2.5	94-1899	F				X	X	X			X		X				X	
SB	MW-07	RM-MW-07-7.5'	07/09/94		7.5	7.5	94-1899	F				X	X				X		X				X	
SB	MW-07	RM-MW-07-10.0'	07/09/94		10	10	94-1899	F				X	X				X		X				X	
SB	MW-07D	RM-MW-07-2.5D	07/09/94		2.5	2.5	94-1899	F				X	X	X			X		X				X	
SB	MW-08	RM-MW-08-S	07/07/94		0	0	94-1882	F				X	X				X		X				X	
SB	MW-08	RM-MW-08-2.5	07/07/94		2.5	2.5	94-1882	F				X	X				X		X				X	
SB	MW-09	RM-MW09-S	08/04/94		0	0	94-2179	F				X	X	X		X	X	X	X				X	
SB	MW-09	RM-MW09-2.5	08/04/94	8/31/94	2.5	2.5	94-2179	F								X	X							
SB	MW-09	RM-MW09-17.5	08/04/94		17.5	17.5	94-2179	F				X	X	X			X		X				X	
SB	MW-10	RM-MW10-S	08/05/94		0	0	94-2202	F				X	X	X		X	X		X				X	
SB	MW-10	RM-MW10-2.5	08/05/94	8/31/94	2.5	2.5	94-2202	F								X								
SB	MW-10	RM-MW10-7.5	08/05/94		7.5	7.5	94-2202	F				X	X				X		X				X	
SB	MW-10	RM-MW10-10	08/05/94		10	10	94-2202	F				X	X				X		X				X	
SB	MW-11a	RM-MW11-S	08/04/94		0	0	94-2202	F				X	X	X		X	X	X	X			X	X	
SB	MW-11b	RM-MW11-2.5	08/04/94	8/31/94	2.5	2.5	94-2202	F								X								
SB	MW-11c	RM-MW11-5.0	08/04/94		5	5	94-2202	F				X	X	X			X		X				X	
SB	MW-11d	RM-MW11-7.5	08/04/94		7.5	7.5	94-2202	F				X	X	X			X		X				X	
SB	MW-12a	RM-MW12-S	08/04/94		0	0	94-2179	F				X	X	X		X	X	X	X				X	
SB	MW-12b	RM-MW12-7.5	08/04/94		7.5	7.5	94-2179	F				X	X	X			X		X				X	

Notes:

(a) F = Final results

P = Preliminary results

INC = Incomplete set of preliminary results, outstanding data.

North Landfill East Area

PROJECT NUMBER	TEST PIT NUMBER
OPE 39285.A0	SHEET 1 OF 10

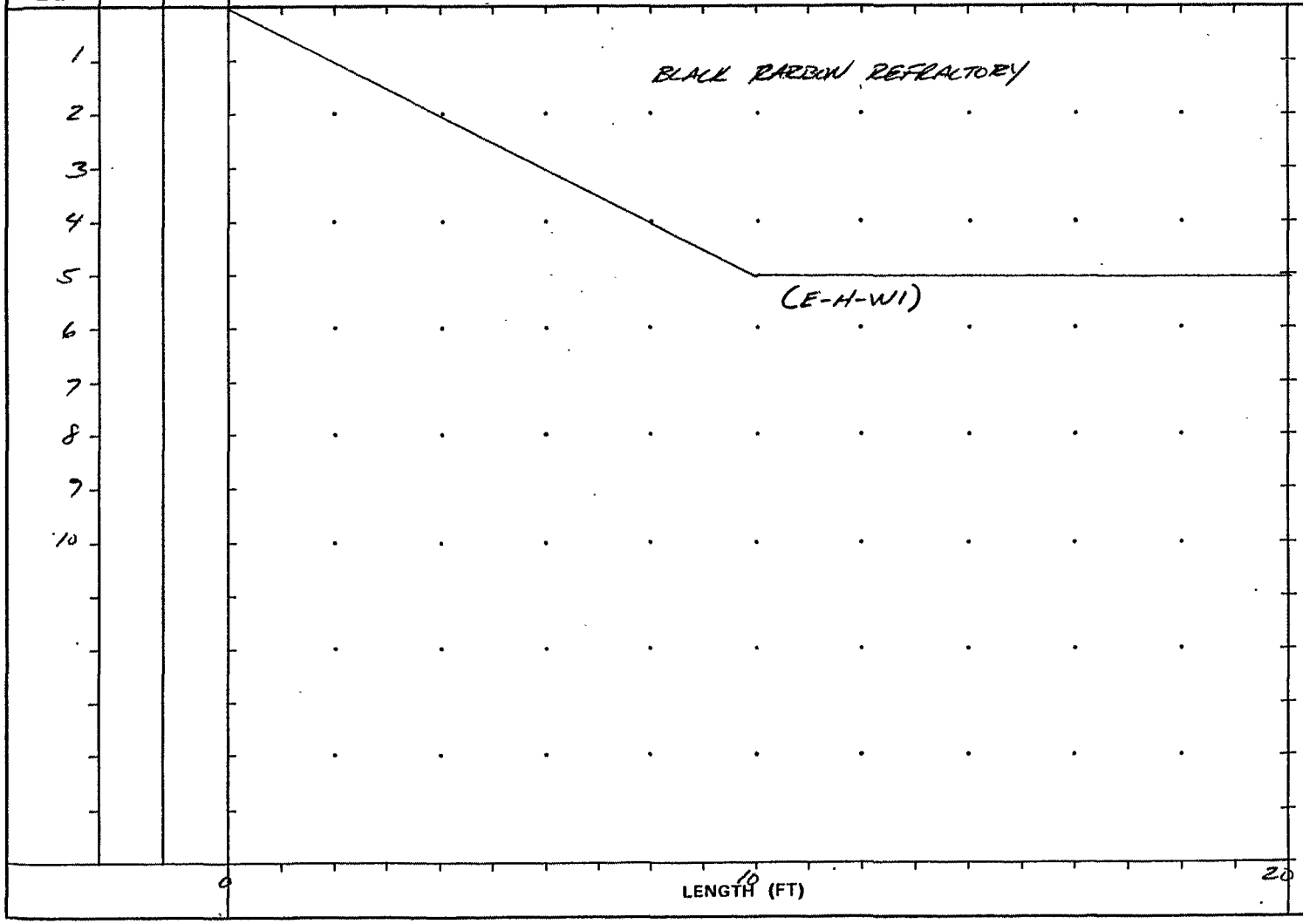
TEST PIT WALL LOG

PROJECT RMC UNKNOWN WASTE PILE LOCATION EAST HEADING WEST MAP OF ____ WALL OF PIT

ELEVATION ____ CONTRACTOR IMW DATE EXCAVATED 6/20/94

WATER LEVEL AND DATE ____ EXCAVATION METHOD CAT 416B LOGGER RWO

APPROXIMATE DIMENSIONS: LENGTH ____ WIDTH ____ DEPTH ____ REMARKS ____



REV 7/86 FORM D1599

PROJECT NUMBER	TEST PIT NUMBER
OPE 3928S.A0	SHEET 2 OF 10

TEST PIT WALL LOG

PROJECT RMA UNKNOWN WASTE PILE LOCATION EAST HEADING WEST MAP OF ____ WALL OF PIT

ELEVATION ____ CONTRACTOR IMW DATE EXCAVATED 6/20/94

WATER LEVEL AND DATE ____ EXCAVATION METHOD CAT 416B LOGGER RWD

APPROXIMATE DIMENSIONS: LENGTH ____ WIDTH ____ DEPTH ____ REMARKS ____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	COMMENTS
1			
2			
3			
4			NO EXCAVATION ASSUME 5' DEEP BLACK CARBON REFRACTORY
5			BLACK CARBON REFRACTORY (E-H-W1)
6			
7			
8			
9			
10			

20 30 40

LENGTH (FT)

REV 7/86 FORM D1599

CRMHILL

PROJECT NUMBER	TEST PIT NUMBER
OPE 39285.A0	SHEET 3 OF 10

TEST PIT WALL LOG

PROJECT RMC UNKNOWN WASTE PILE LOCATION EAST HEADING WEST MAP OF ____ WALL OF PIT

ELEVATION ____ CONTRACTOR JMW DATE EXCAVATED 6/20/94

WATER LEVEL AND DATE ____ EXCAVATION METHOD CAT 416B LOGGER RWO

APPROXIMATE DIMENSIONS: LENGTH ____ WIDTH ____ DEPTH ____ REMARKS ____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	COMMENTS
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

NO EXCAVATION
ASSUME 5' DEEP.
BLACK CARBON REFRACTORY

BLACK CARBON REFRACTORY
W/ BRICKS

(E-H-W2)

40 50 60
LENGTH (FT)

REV 7/86 FORM D1599

CH2MHILL

PROJECT NUMBER	TEST PIT NUMBER
OPE 39285.A0	SHEET 4 OF 10

TEST PIT WALL LOG

PROJECT RMC UNKNOWN WASTE PILE LOCATION EAST HEADING WEST MAP OF ____ WALL OF PIT

ELEVATION ____ CONTRACTOR INW DATE EXCAVATED 6/20/94

WATER LEVEL AND DATE ____ EXCAVATION METHOD CAT 416B LOGGER RWO

APPROXIMATE DIMENSIONS: LENGTH ____ WIDTH ____ DEPTH ____ REMARKS ____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	COMMENTS
1			
2			
3			
4			
5			
6			BLACK CARBON REFRACTORY
7			SOME DEBRIS
8			ANODE BLOCKS FOUND IN EXCAVATION
9			(E-H-W2)
10			
11			
12			

60 70 80

LENGTH (FT)

REV 7/86 FORM D1599

PROJECT NUMBER	TEST PIT NUMBER
OPE 39285.A6	SHEET 5 OF 10

TEST PIT WALL LOG

PROJECT RML UNKNOWN WASTE PILE LOCATION EAST HEADING WEST MAP OF ____ WALL OF PIT

ELEVATION ____ CONTRACTOR IMW DATE EXCAVATED 6/20/84

WATER LEVEL AND DATE ____ EXCAVATION METHOD CAT 416B LOGGER RWO

APPROXIMATE DIMENSIONS: LENGTH ____ WIDTH ____ DEPTH ____ REMARKS ____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	COMMENTS
1			
2			
3			
4			
5			
6			NO EXCAVATION
7			ASSUME 9' DEEP
8			BLACK CARBON REFRACTORY w/ DEBRIS
9			
10			
11			
12			

80 90 100

LENGTH (FT)

REV 7/86 FORM D1599

CH2M HILL

PROJECT NUMBER	TEST PIT NUMBER
OPE 3928S.A0	SHEET 6 OF 10

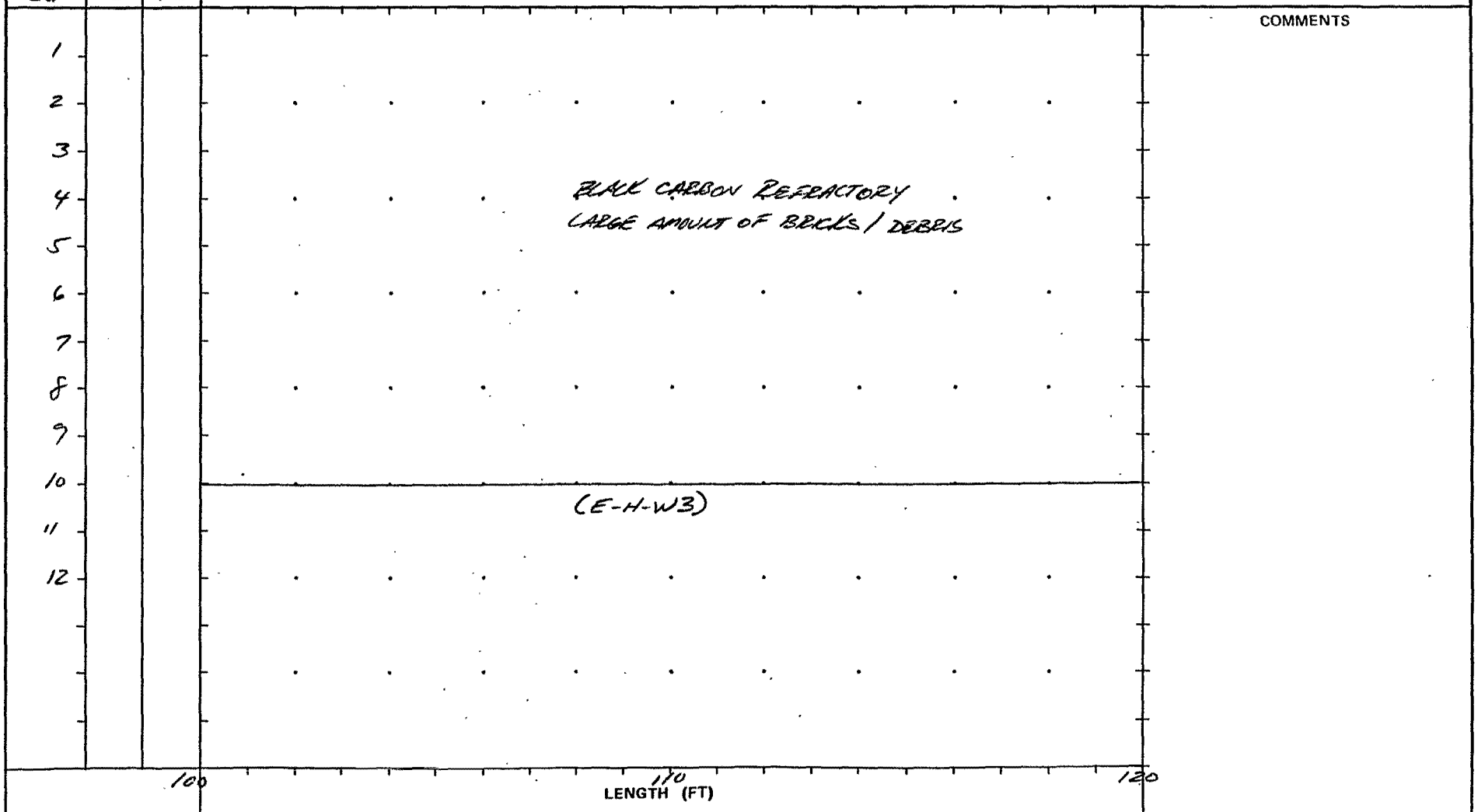
TEST PIT WALL LOG

PROJECT RMC UNKNOWN WASTE PILE LOCATION EAST HEADING WEST MAP OF ____ WALL OF PIT

ELEVATION ____ CONTRACTOR JMM DATE EXCAVATED 6/20/94

WATER LEVEL AND DATE ____ EXCAVATION METHOD CAT 416B LOGGER RWO

APPROXIMATE DIMENSIONS: LENGTH ____ WIDTH ____ DEPTH ____ REMARKS ____



REV 7/86 FORM D1599

CH2M HILL

PROJECT NUMBER	TEST PIT NUMBER
ODE39285.A0	SHEET 7 OF 10

TEST PIT WALL LOG

PROJECT RMC HANFORD WASTE PILE LOCATION EAST HEADING WEST MAP OF ____ WALL OF PIT

ELEVATION ____ CONTRACTOR IHW DATE EXCAVATED 6/20/84

WATER LEVEL AND DATE ____ EXCAVATION METHOD CAT 416B LOGGER RWO

APPROXIMATE DIMENSIONS: LENGTH ____ WIDTH ____ DEPTH ____ REMARKS ____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

NO EXCAVATION
ASSUME SAME AS (E-H-W3)

COMMENTS

120 130 140
LENGTH (FT)

REV 7/86 FORM D1599

CH2M HILL

PROJECT NUMBER	TEST PIT NUMBER
OPE 3928S.A0	SHEET 8 OF 10

TEST PIT WALL LOG

PROJECT RMC UNKNOWN WASTE PILE LOCATION EAST HEADING WEST MAP OF ____ WALL OF PIT

ELEVATION ____ CONTRACTOR IMW DATE EXCAVATED 6/20/84

WATER LEVEL AND DATE ____ EXCAVATION METHOD CAT 416B LOGGER RWO

APPROXIMATE DIMENSIONS: LENGTH ____ WIDTH ____ DEPTH ____ REMARKS ____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

NO EXCAVATION ASSUME SAME AS (E-H-W3)

BLACK CARBON REFRACTORY W/ DEBRIS

BLACK OILY SILTS @ BOTTOM OF EXCAVATION

(E-H-W4)

COMMENTS

WASTE PILE DEPTH EXCEEDS THE REACH OF THE CAT 416B

DIESEL SMELL NOTED @ BOTTOM OF EXCAVATION

14 15 16

LENGTH (FT)

REV 7/86 FORM D1599

CH2MHILL

PROJECT NUMBER	TEST PIT NUMBER
OPE39285.A0	SHEET 9 OF 10

TEST PIT WALL LOG

PROJECT RML UNKNOWN WASTE PILE LOCATION EAST HEADING WEST MAP OF ____ WALL OF PIT

ELEVATION ____ CONTRACTOR IMW DATE EXCAVATED 6/20/94

WATER LEVEL AND DATE ____ EXCAVATION METHOD CAT 416B LOGGER RWO

APPROXIMATE DIMENSIONS: LENGTH ____ WIDTH ____ DEPTH ____ REMARKS ____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	COMMENTS
1			
2			
3			
4			
5			
6			
7			
8			NO EXCAVATION! ASSUME SAME AS (E-W-WH)
9			
10			
11			
12			

160 170 180

LENGTH (FT)

REV 7/86 FORM D1599

PROJECT NUMBER	TEST PIT NUMBER
OPE 35285.A6	SHEET 10 OF 10

TEST PIT WALL LOG

PROJECT RMC UNKNOWN WASTE PILE LOCATION EAST-HEADING WEST MAP OF ____ WALL OF PIT

ELEVATION ____ CONTRACTOR IAW DATE EXCAVATED 6/20/94

WATER LEVEL AND DATE ____ EXCAVATION METHOD CAT 416B LOGGER RWO

APPROXIMATE DIMENSIONS: LENGTH ____ WIDTH ____ DEPTH ____ REMARKS ____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

BLACK CARBON REFRACTORY W/ BRICKS

WASTE PILE DEPTH EXCEEDS THE REACH OF THE CAT 416B

(E-H-W5)

NO EXCAVATION ASSUME SAME AS (E-H-W5)

COMMENTS

180 190 200 @ ROAD

LENGTH (FT)

REV 7/86 FORM D1599

CH2M HILL

PROJECT NUMBER	TEST PIT NUMBER
OPE 39285.A0	SHEET 1 OF 7

TEST PIT WALL LOG

PROJECT RMC UNKNOWN WASTE PILE LOCATION SOUTH HEADING NORTH MAP OF ____ WALL OF PIT

ELEVATION ____ CONTRACTOR IMW DATE EXCAVATED 6/20/94

WATER LEVEL AND DATE ____ EXCAVATION METHOD CAT 416 B LOGGER RWO

APPROXIMATE DIMENSIONS: LENGTH ____ WIDTH ____ DEPTH ____ REMARKS ____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	COMMENTS
1			SOIL COVER
2			BROWN SILT
3			BLACK CARBON REFRACTORY
4			w/ BRICK
5			
6			
7			
8			(S-H-N1)
9			
10			

0 10 20
LENGTH (FT)

REV 7/86 FORM D1599

CH2M HILL

PROJECT NUMBER	TEST PIT NUMBER
OPE 39285.A0	SHEET 2 OF 7

TEST PIT WALL LOG

PROJECT RMC UNKNOWN WASTE PILE LOCATION SOUTH HEADING NORTH MAP OF ____ WALL OF PIT

ELEVATION ____ CONTRACTOR IMW DATE EXCAVATED 6/20/94

WATER LEVEL AND DATE ____ EXCAVATION METHOD CAT 416B LOGGER RWO

APPROXIMATE DIMENSIONS: LENGTH ____ WIDTH ____ DEPTH ____ REMARKS ____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	COMMENTS
1			NO EXCAVATION
2			ASSUME 2' SOIL COVER
3			
4			ASSUME BLACK CARBON REFRACT
5			W/ BRICKS
6			
7			
8			
9			
10			

20 30 40

LENGTH (FT)

REV 7/86 FORM D1599

PROJECT NUMBER	TEST PIT NUMBER
OPE 39285.A0	SHEET 3 OF 7

TEST PIT WALL LOG

PROJECT RMC UNKNOWN WASTE PILE LOCATION SOUTH HEADING NORTH MAP OF ____ WALL OF PIT

ELEVATION ____ CONTRACTOR IMW DATE EXCAVATED 6/20/94

WATER LEVEL AND DATE ____ EXCAVATION METHOD CAT 416B LOGGER RWO

APPROXIMATE DIMENSIONS: LENGTH ____ WIDTH ____ DEPTH ____ REMARKS ____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	COMMENTS
1			NO EXCAVATION
2			ASSUME 2' SOIL COVER
3			
4			ASSUME BLACK CARBON REFRACTORY w/ BRICKS
5			BLACK CARBON REFRACTORY w/ BRICKS and DEBRIS (ASBESTOS)
6			
7			
8			
9	1		(E-H-N2)
10			

40 LENGTH (FT) 60

REV 7/86 FORM D1599

CH2M HILL

PROJECT NUMBER	TEST PIT NUMBER
OPE39285.A6	SHEET 4 OF 7

TEST PIT WALL LOG

PROJECT RMC UNKNOWN WASTE PILE LOCATION SOUTH HEADING NORTH MAP OF ____ WALL OF PIT

ELEVATION ____ CONTRACTOR IMW DATE EXCAVATED 6/20/94

WATER LEVEL AND DATE ____ EXCAVATION METHOD CAT 416B LOGGER RWV

APPROXIMATE DIMENSIONS: LENGTH ____ WIDTH ____ DEPTH ____ REMARKS ____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	COMMENTS
1			
2			NO EXCAVATION
3			ASSUME 8' DEEP
4			BLACK CARBON REFRACTORY
5			w/ BRICKS etc...
6			
7			
8			
9			
10			

60 70 80

LENGTH (FT)

REV 7/86 FORM D1599

CH2M HILL

PROJECT NUMBER	TEST PIT NUMBER
OPE 39285.A6	SHEET 5 OF 7

TEST PIT WALL LOG

PROJECT RMC UNKNOWN WASTE PILE LOCATION SOUTH HEADING NORTH MAP OF ____ WALL OF PIT

ELEVATION ____ CONTRACTOR IMW DATE EXCAVATED 6/20/94

WATER LEVEL AND DATE ____ EXCAVATION METHOD CAT 416B LOGGER RWO

APPROXIMATE DIMENSIONS: LENGTH ____ WIDTH ____ DEPTH ____ REMARKS ____

DEPTH BELOW SURFACE (FT) | SAMPLE: INTERVAL | SAMPLE: TYPE AND NUMBER | COMMENTS

1
2
3
4
5
6
7
8
9
10
11
12

BLACK CARBON REFRACTORY w/ BRICKS

NOT EXCAVATED
ASSUME SAME AS (S-H-N3)

WASTE PILE DEPTH EXCEEDED THE REACH OF THE CAT 416B

(S-H-N3)

DEEL SHELL NOTED @ BOTTOM OF EXCAVATION

80 90 100
LENGTH (FT)

REV 7/86 FORM D1599

CH2M HILL

PROJECT NUMBER	TEST PIT NUMBER
OPE39285.A0	SHEET 6 OF 7

TEST PIT WALL LOG

PROJECT RML UNKNOWN WASTE PILE LOCATION SOUTH HEADING NORTH MAP OF ____ WALL OF PIT

ELEVATION ____ CONTRACTOR IMW DATE EXCAVATED 6/20/94

WATER LEVEL AND DATE ____ EXCAVATION METHOD CAT 416B LOGGER RWO

APPROXIMATE DIMENSIONS: LENGTH ____ WIDTH ____ DEPTH ____ REMARKS ____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	COMMENTS
1			
2			
3			
4			NOT EXCAVATED
5			ASSUME SAME AS (S-H-N3)
6			
7			
8			
9			
10			
11			
12			

100 110 120

LENGTH (FT)

REV 7/86 FORM D1599

CH2M HILL

PROJECT NUMBER	TEST PIT NUMBER
OPE 3928S.A0	SHEET 7 OF 7

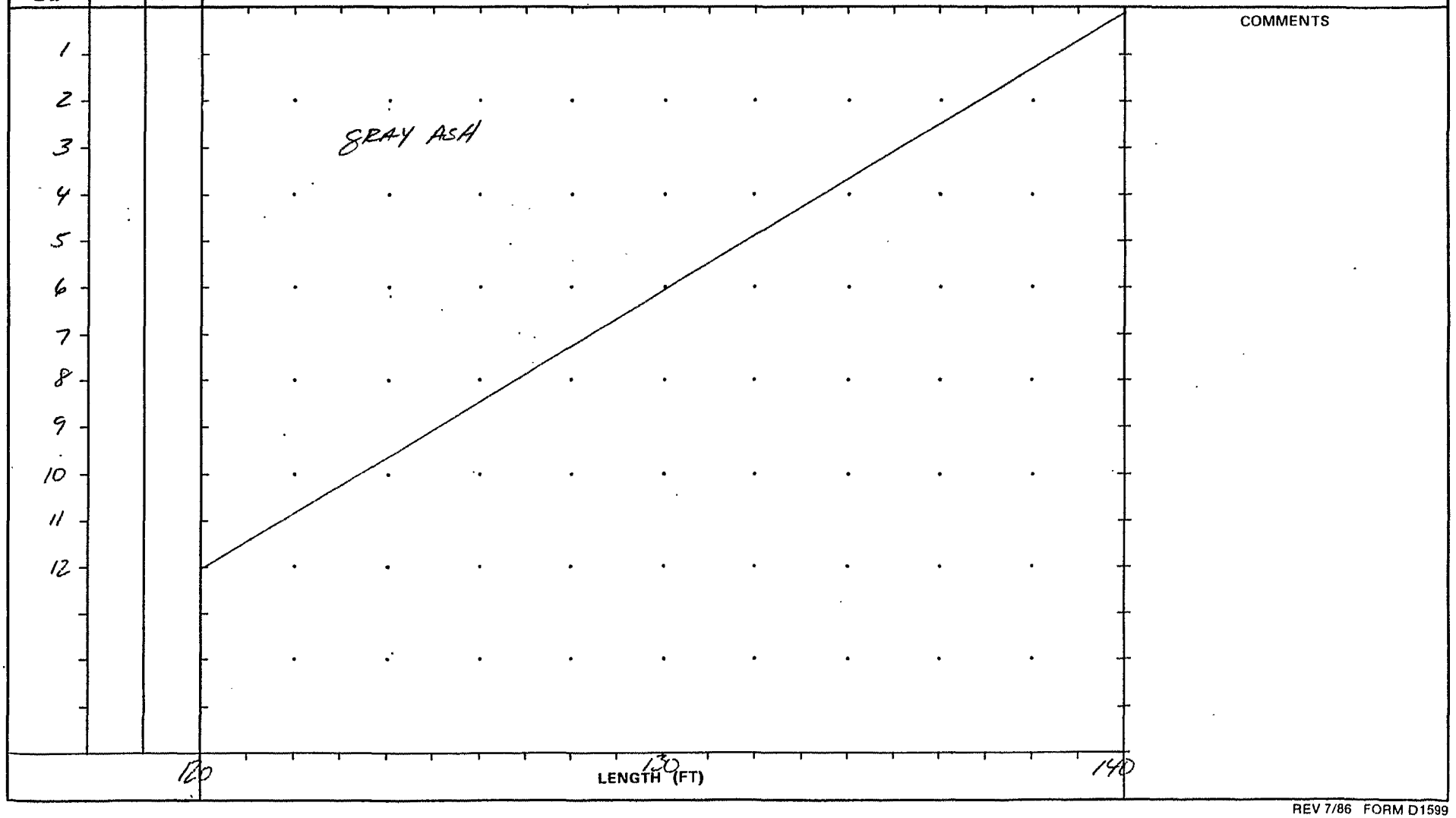
TEST PIT WALL LOG

PROJECT RMC UNKNOWN WASTE PILE LOCATION SOUTH HEADING NORTH MAP OF ____ WALL OF PIT

ELEVATION ____ CONTRACTOR IMW DATE EXCAVATED 6/20/94

WATER LEVEL AND DATE ____ EXCAVATION METHOD CAT 416B LOGGER BLO

APPROXIMATE DIMENSIONS: LENGTH ____ WIDTH ____ DEPTH ____ REMARKS ____



REV 7/86 FORM D1599

North Landfill West Area

CH2MHILL

PROJECT NUMBER	TEST PIT NUMBER	SHEET	OF
	EHW3	1	1

TEST PIT WALL LOG

PROJECT _____ LOCATION middle of cleared area (see below) MAP OF N WALL OF PIT

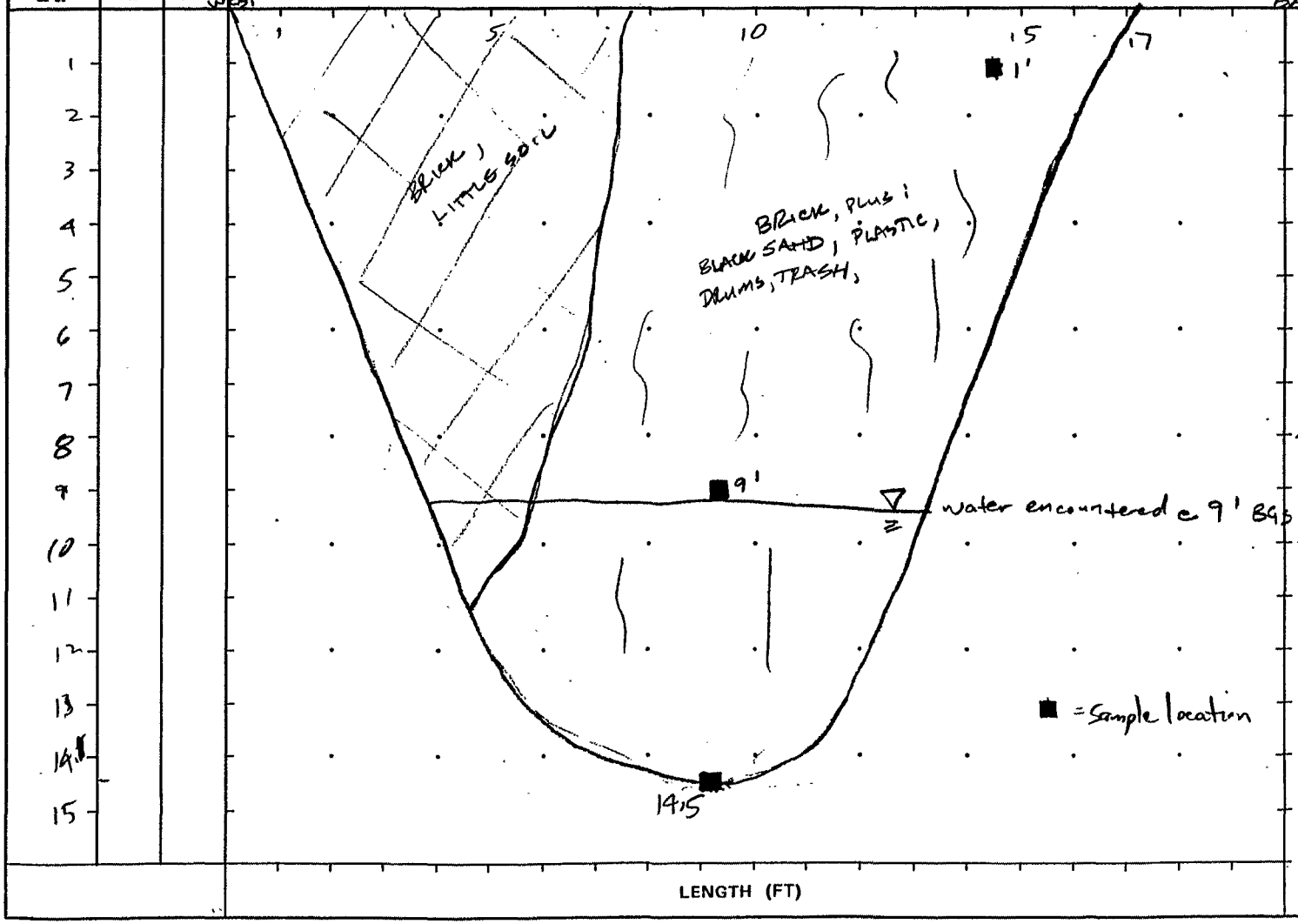
ELEVATION unknown CONTRACTOR STRAPUS DATE EXCAVATED 1/19/94

WATER LEVEL AND DATE 9'; 7/19/94 EXCAVATION METHOD CAT 416B Backhoe LOGGER R. Johns

APPROXIMATE DIMENSIONS: LENGTH 17' WIDTH 5' DEPTH 14.5' REMARKS 85°F, Sunny

SAMPLE: INTERVAL | TYPE AND NUMBER

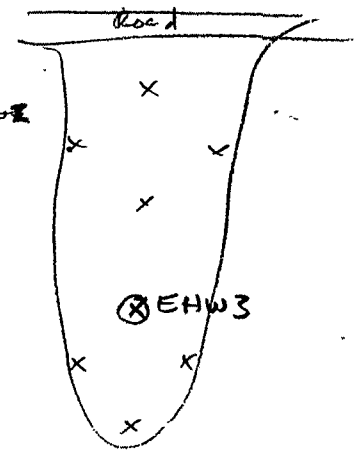
DEPTH BELOW SURFACE (FT)



LENGTH (FT)

COMMENTS

FILL FOR ENTIRE 14.5' OF TEST PIT, FILL IS BRICK, PLASTIC, DRUMS, TRASH, WIRE CABLE, WOOD, SOIL IS SAND, BLACK,



REV 7/86 FORM D1599

CH2M HILL

PROJECT NUMBER	TEST PIT NUMBER	SHEET 1 OF 1
	EHW4	

TEST PIT WALL LOG

PROJECT RMC LOCATION North (west) Landfill Area MAP OF ____ WALL OF PIT

ELEVATION ____ CONTRACTOR STRATUS DATE EXCAVATED 7/19/94

WATER LEVEL AND DATE ____ EXCAVATION METHOD CAT 426 LOGGER PWO

APPROXIMATE DIMENSIONS: LENGTH 10 WIDTH 6' DEPTH 7 REMARKS Sunny 80°

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Brick/chimney flues

COMMENTS

1 2 3 4 LENGTH (FT) 6 7 8 9 10

REV 7/86 FORM D1599

CH2M HILL

PROJECT NUMBER	TEST PIT NUMBER	
0F2.39723.B003	SHN1	SHEET 1 OF 1

TEST PIT WALL LOG

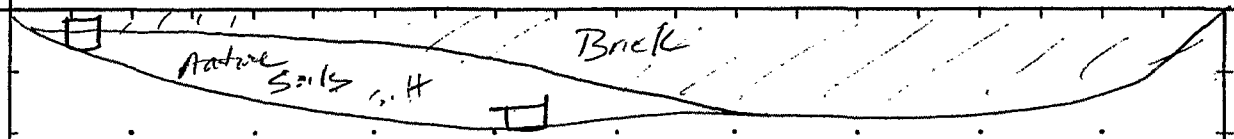
PROJECT RMC Northwest Landfill area LOCATION _____ MAP OF 4 WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS DATE EXCAVATED 7/20/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD Cat 416b LOGGER Rue

APPROXIMATE DIMENSIONS: LENGTH 15 WIDTH 3 DEPTH 2 REMARKS _____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		



COMMENTS

Samples collected @ □

LENGTH (FT)

REV 7/86 FORM D1599

CRA HILL

PROJECT NUMBER	TEST PIT NUMBER	
OBE39293.B0.03	SHN2	SHEET 1 OF 1

TEST PIT WALL LOG

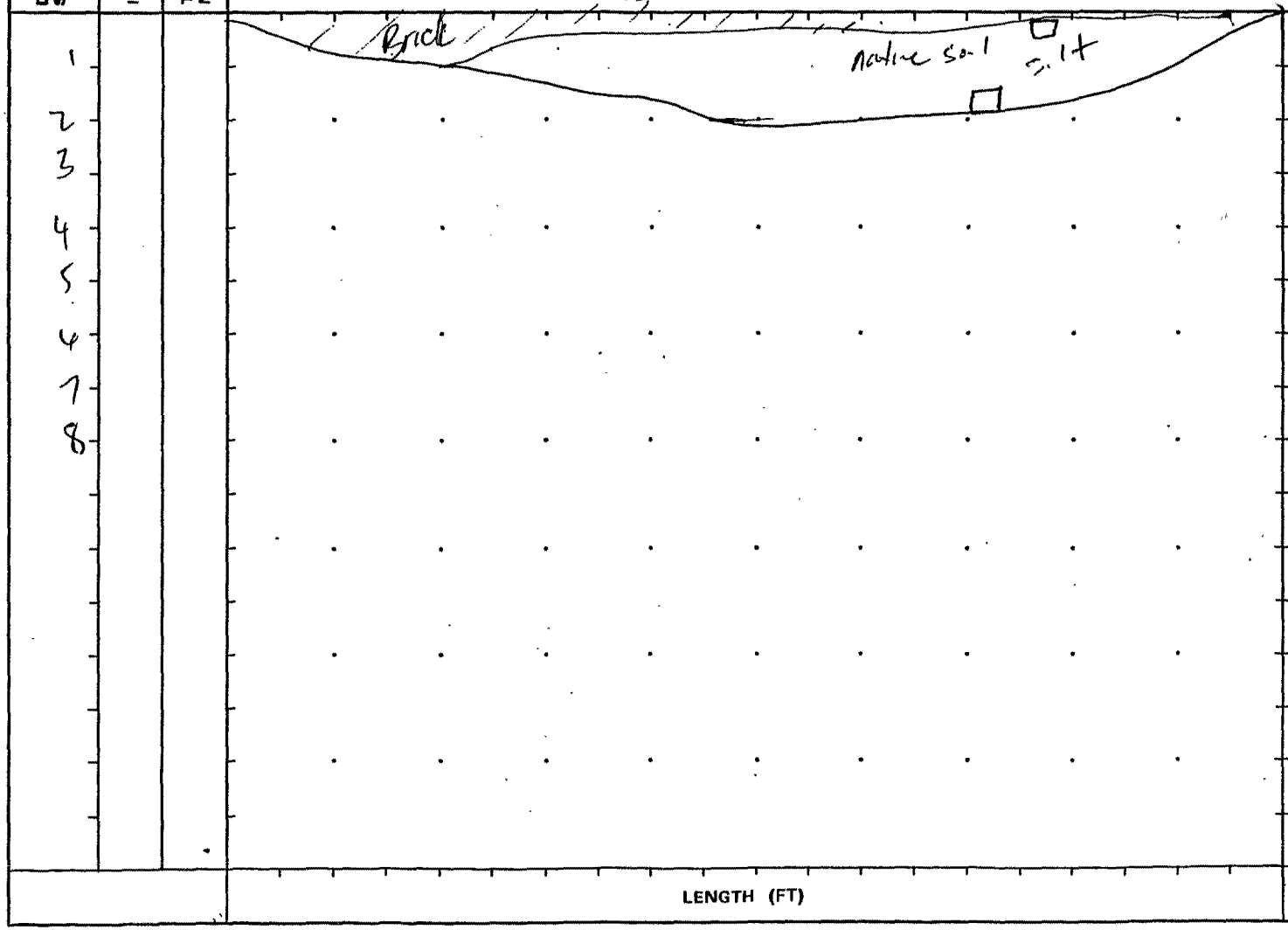
PROJECT RMC North (West) Landfill Area LOCATION _____ MAP OF W WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS DATE EXCAVATED _____

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT 416B LOGGER RMO

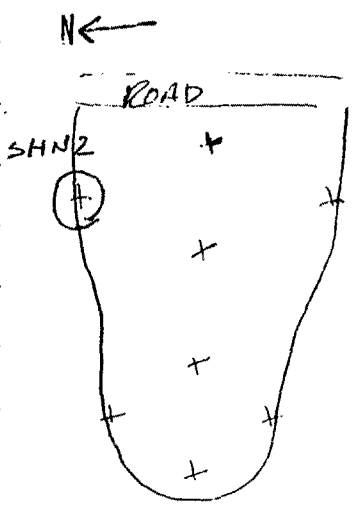
APPROXIMATE DIMENSIONS: LENGTH 15 WIDTH 3 DEPTH 2 REMARKS _____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		
5		
6		
7		
8		



COMMENTS

Samples collected @



REV 7/86 FORM D1599

CH2M HILL

PROJECT NUMBER	TEST PIT NUMBER	
DPE 39293.B0.03	SHN3	SHEET 1 OF 1

TEST PIT WALL LOG

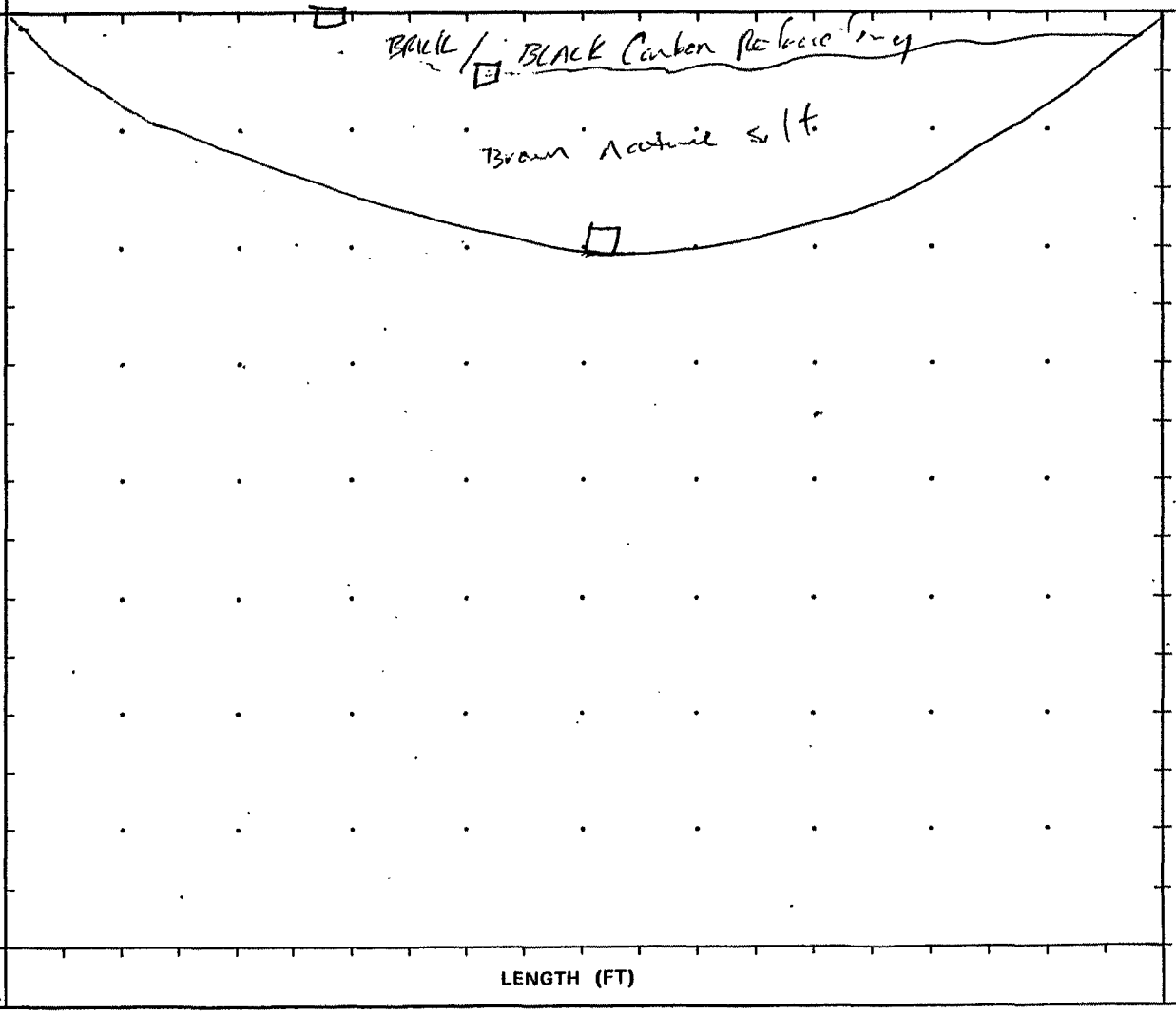
PROJECT PMC North Landfill Area (west) LOCATION _____ MAP OF W WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS DATE EXCAVATED 7/20/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT 416 B LOGGER RWJ

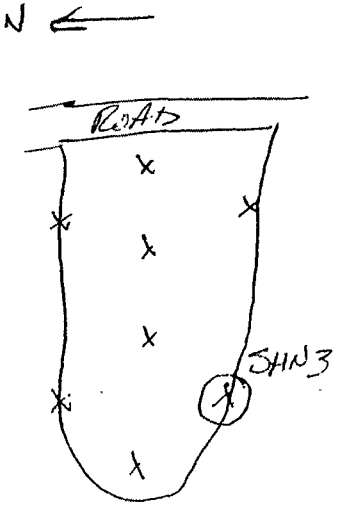
APPROXIMATE DIMENSIONS: LENGTH 14 WIDTH 3 DEPTH 4 REMARKS _____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		
5		
6		



COMMENTS

Sample e ☐



REV 7/86 FORM D1599

CRM HILL

PROJECT NUMBER	TEST PIT NUMBER	SHEET	OF
	SHN4	1	1

TEST PIT WALL LOG

PROJECT _____ LOCATION Edge of Cleared area (see below) MAP OF E WALL OF PIT

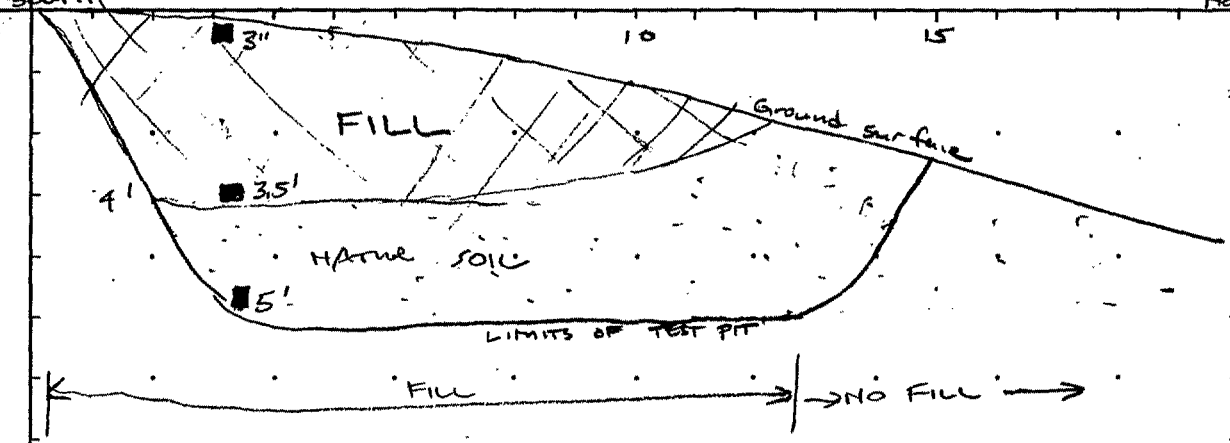
ELEVATION unk CONTRACTOR STRATUS DATE EXCAVATED 7/19/94

WATER LEVEL AND DATE none observed EXCAVATION METHOD CAT 416B Backhoe LOGGER R. Johns

APPROXIMATE DIMENSIONS: LENGTH 15' WIDTH 4' DEPTH 5-6' REMARKS 85° F, Sunny

SAMPLE: INTERVAL | TYPE AND NUMBER

DEPTH BELOW SURFACE (FT)



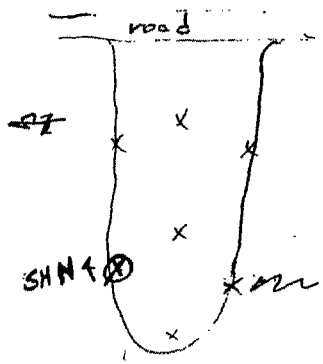
LENGTH (FT)

COMMENTS

FILL TO 4.0' - BRICKS, SLABS, CONCRETE, W/SILT FILL MATERIAL

4.0'-6' - NATIVE SOIL - SILT, MED. BRN, DRY, SOFT TO STIFF, (ML)

photo # 21 is looking east at wall - notice fill to 3.5' / notice below that is silt, med brn, dry, ~~soft~~ soft to stiff, (ML)



REV 7/86 FORM D1599

CRMHILL

PROJECT NUMBER	TEST PIT NUMBER	SHEET	OF
[illegible] 3793.B0.03	ETW1	1	1

TEST PIT WALL LOG

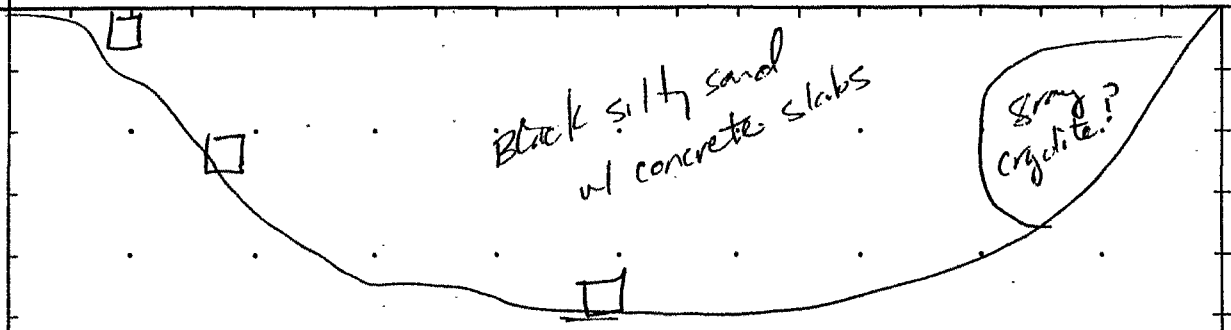
PROJECT PMC Northwest Landfill area LOCATION _____ MAP OF S WALL OF PIT

ELEVATION _____ CONTRACTOR STATUS DATE EXCAVATED 7/20/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD Cat 416B LOGGER RWD

APPROXIMATE DIMENSIONS: LENGTH 12 WIDTH 5 DEPTH 5 REMARKS _____

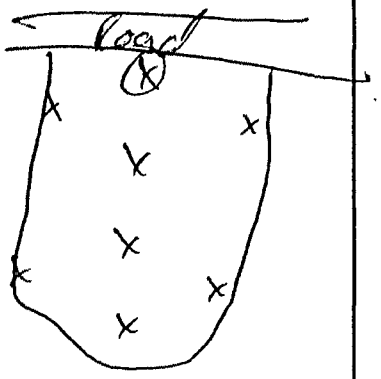
DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		



LENGTH (FT)

COMMENTS

Samples Collected @ Ext



REV 7/86 FORM D1599

CH2M HILL

PROJECT NUMBER	TEST PIT NUMBER	SHEET 1 OF 1
	EHW2	

TEST PIT WALL LOG

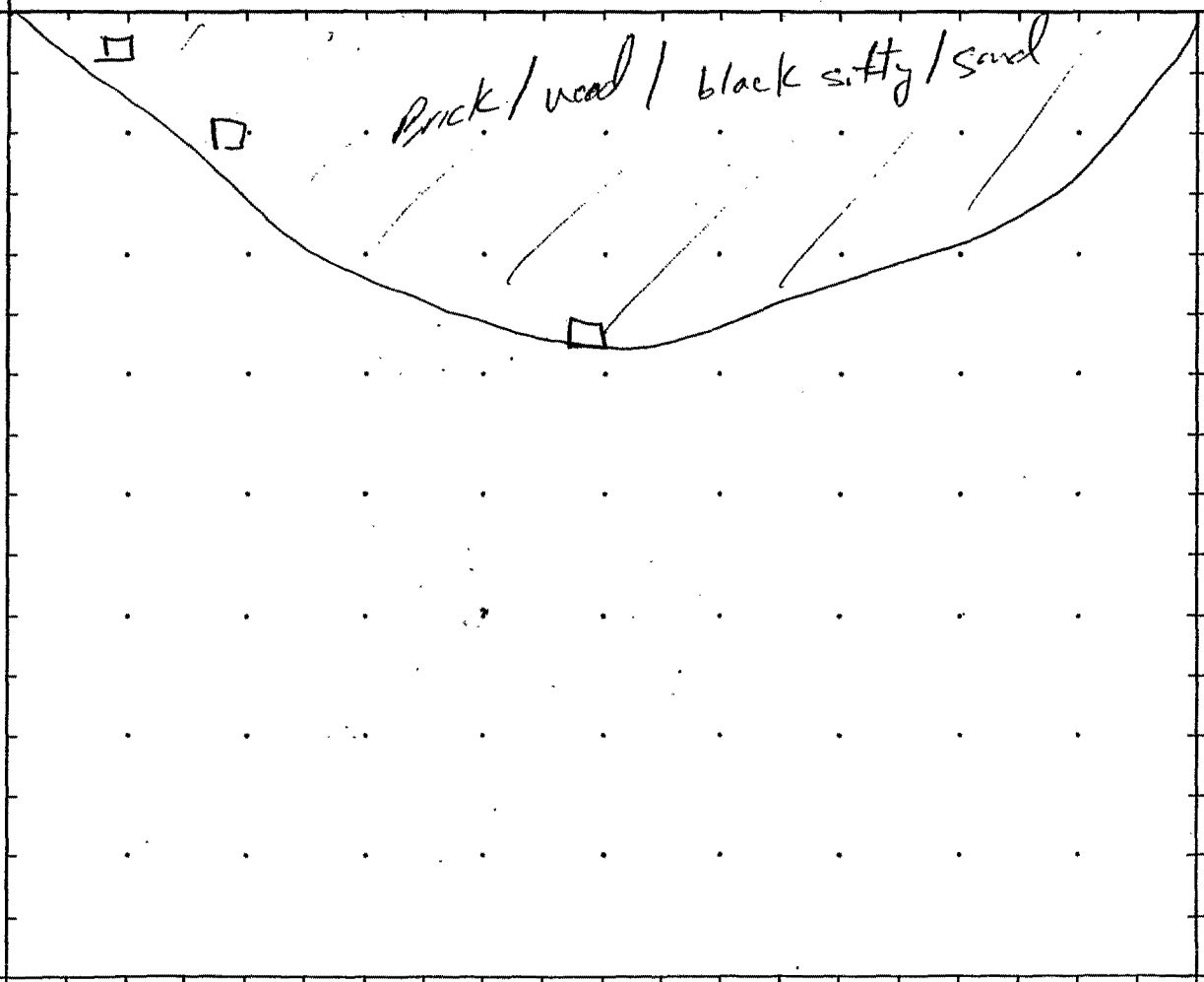
PROJECT PWC Northwest Landfill LOCATION MAP OF S WALL OF PIT

ELEVATION CONTRACTOR STRATUS DATE EXCAVATED 7/20/94

WATER LEVEL AND DATE 5.5' 7/20/94 EXCAVATION METHOD Cat 416B LOGGER RWD

APPROXIMATE DIMENSIONS: LENGTH 11 WIDTH 4 DEPTH 5.5 REMARKS water @ 5.5'

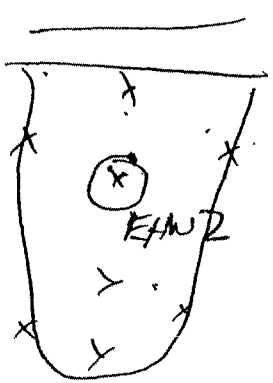
DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		



COMMENTS

Samples collected @ □

OVM reading 1.5ppm Diesal smell coming from the pit



REV 7/86 FORM D1599

South Landfill Area

CH2M HILL

PROJECT NUMBER	TEST PIT NUMBER	
OPE39293.B5.01	B2	SHEET 1 OF 1

TEST PIT WALL LOG

PROJECT REYNOLDS METALS LOCATION SOUTHERN POTLINER MAP OF S WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS Corp DATE EXCAVATED 9/13/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT 416b LOGGER RWO

APPROXIMATE DIMENSIONS: LENGTH 15 WIDTH 3 DEPTH 6 REMARKS _____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	
1			cryolyte? black
2			silty sand
3			
4			poorly graded sand
5			
6			
7			
8			

LENGTH (FT)

COMMENTS

NO DEBRIS, clean.

pit has odor

Sample @ 5, 2, 4, 6 + Composite.

Time 1300

REV 7/86 FORM D1699

CRA HILL

PROJECT NUMBER	TEST PIT NUMBER	
08323.B0.03	D4	SHEET 1 OF 1

TEST PIT WALL LOG

PROJECT Reynolds Metals South pollution LOCATION _____ MAP OF 4 WALL OF PIT

ELEVATION _____ CONTRACTOR Straus Corp DATE EXCAVATED 9/13/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD Cat 416b LOGGER KW

APPROXIMATE DIMENSIONS: LENGTH 11' WIDTH 3' DEPTH 8 REMARKS _____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		
5		
6		
7		
8		

gray cryolite?

rust colored metal staining?

silt

brick w/ gray cryolite mix?

brown poorly graded sand

COMMENTS

Samples E 5, 2, 4, 6, 8'

LENGTH (FT)

REV 7/86 FORM D1599

CH2MHILL

PROJECT NUMBER	TEST PIT NUMBER	
DPE 39293.B5.01	C1.5	SHEET 1 OF 1

TEST PIT WALL LOG

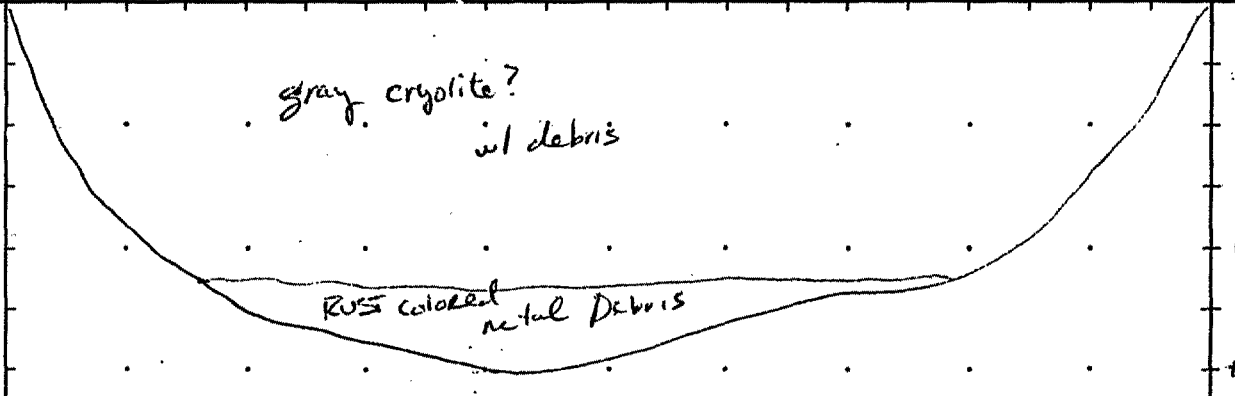
PROJECT Reynolds Metals LOCATION Southern Potliner MAP OF E WALL OF PIT

ELEVATION _____ CONTRACTOR Stratus Corp DATE EXCAVATED 9/13/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT 416b LOGGER [illegible]

APPROXIMATE DIMENSIONS: LENGTH 14 WIDTH 3 DEPTH 6 REMARKS _____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		
5		
6		
7		
8		



LENGTH (FT)

COMMENTS

Metal cuttings

sampled @ 5, 2, 4, 6 + Composite

Sample Time 1330

REV 7/86 FORM D1599

Note: The south landfill was previously termed the "south potliner area." This terminology was revised for this Removal Site Assessment (RSA) report because information available to date (including the results of the RSA) indicate that this fill does not include potliner.

CH2MHILL

PROJECT NUMBER	TEST PIT NUMBER	
176393.P003	EC	SHEET 1 OF 1

TEST PIT WALL LOG

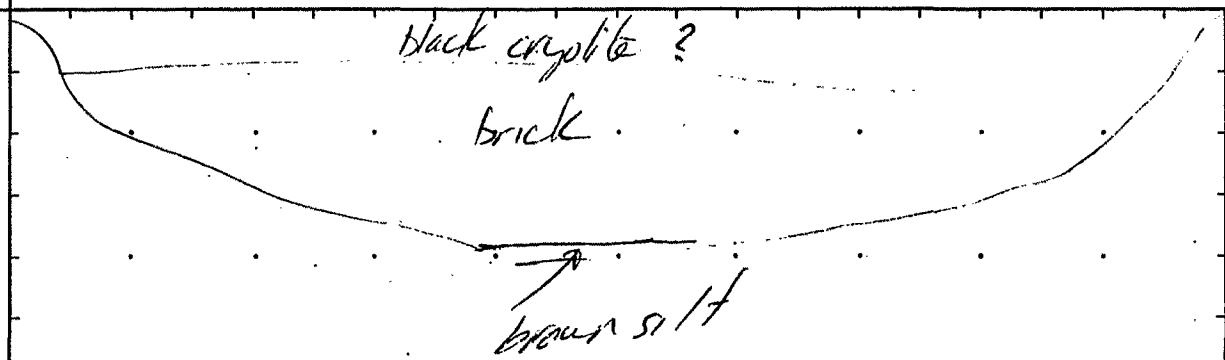
PROJECT LMC Sixth Potliner LOCATION MAP OF W WALL OF PIT

ELEVATION CONTRACTOR STRATUS Corp DATE EXCAVATED 9/13/94

WATER LEVEL AND DATE EXCAVATION METHOD CAT 416 LOGGER LW

APPROXIMATE DIMENSIONS: LENGTH 11' WIDTH 3' DEPTH 4' REMARKS

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	COMMENTS
1			Sampled @
2			5, 4
3			
4			



LENGTH (FT)

REV 7/86 FORM D1599

CH2M HILL

PROJECT NUMBER	TEST PIT NUMBER	SHEET / OF
DE-39-33.2263	E0	1 / 1

TEST PIT WALL LOG

PROJECT Fort South Jetties LOCATION MAP OF W WALL OF PIT

ELEVATION CONTRACTOR STRATUS Co-P DATE EXCAVATED 9/13/84

WATER LEVEL AND DATE EXCAVATION METHOD CAT 416B LOGGER Lwo

APPROXIMATE DIMENSIONS: LENGTH 12' WIDTH 3' DEPTH 4' REMARKS

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	
1			Rock cryolite?
2			brown silt.
3			coarse brown poorly graded sand
4			

COMMENTS

Sam Lot @ 5, 2, 4, C

Soils moist @ 2'

LENGTH (FT)

REV 7/86 FORM D1599

CRA HILL

PROJECT NUMBER	TEST PIT NUMBER	SHEET / OF
0E39253.B0.03	SP1	1 / 1

TEST PIT WALL LOG

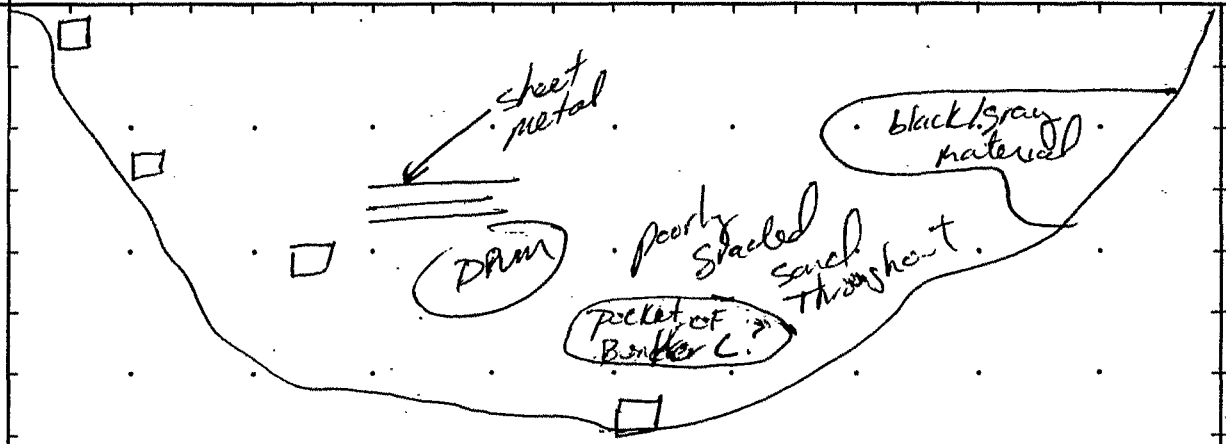
PROJECT RMC Southern Potliner Area LOCATION _____ MAP OF W WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS DATE EXCAVATED 7/20/94

WATER LEVEL AND DATE @ 7' 7/20/94 EXCAVATION METHOD Cat 416B LOGGER RWW

APPROXIMATE DIMENSIONS: LENGTH 12 WIDTH 4 DEPTH 7 REMARKS _____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		



COMMENTS

Samples collected @ □

LENGTH (FT)

REV 7/86 FORM D1599

CH2MHILL

PROJECT NUMBER	TEST PIT NUMBER	
0BE39793.B0.03	SP2	SHEET 1 OF 1

TEST PIT WALL LOG

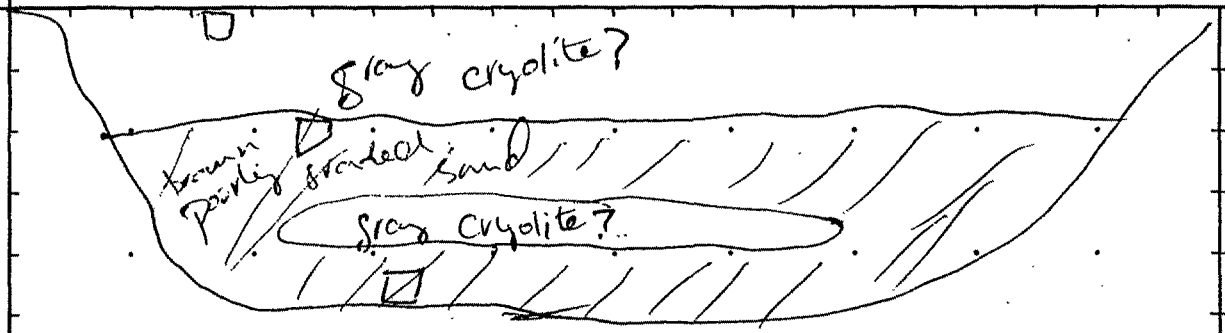
PROJECT DMC southern potliner LOCATION _____ MAP OF E WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS DATE EXCAVATED 7/20/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT 416B LOGGER _____

APPROXIMATE DIMENSIONS: LENGTH 12 WIDTH 4 DEPTH 5 REMARKS _____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		



COMMENTS

Very Little debris

Samples Collected @ surface, 2.5' and 5'

LENGTH (FT)

REV 7/86 FORM D1599

CH2M HILL

PROJECT NUMBER	TEST PIT NUMBER	
OPE39293.B0.03	SP3	SHEET 1 OF 1

TEST PIT WALL LOG

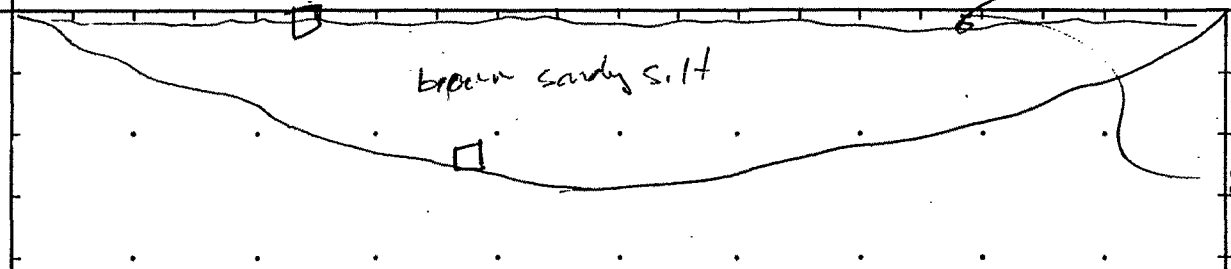
PROJECT RMC Southern Pot Liner LOCATION _____ MAP OF W WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS DATE EXCAVATED 7/21/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT 416b LOGGER Reed

APPROXIMATE DIMENSIONS: LENGTH 10 WIDTH 3 DEPTH 2.5 REMARKS _____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	COMMENTS
1			
2			
3			
4			
5			
6			
7			
8			



LENGTH (FT)

REV 7/86 FORM D1599

CRA HILL

PROJECT NUMBER	TEST PIT NUMBER	
OPE 39293.B2.03	SP4	SHEET 1 OF 1

TEST PIT WALL LOG

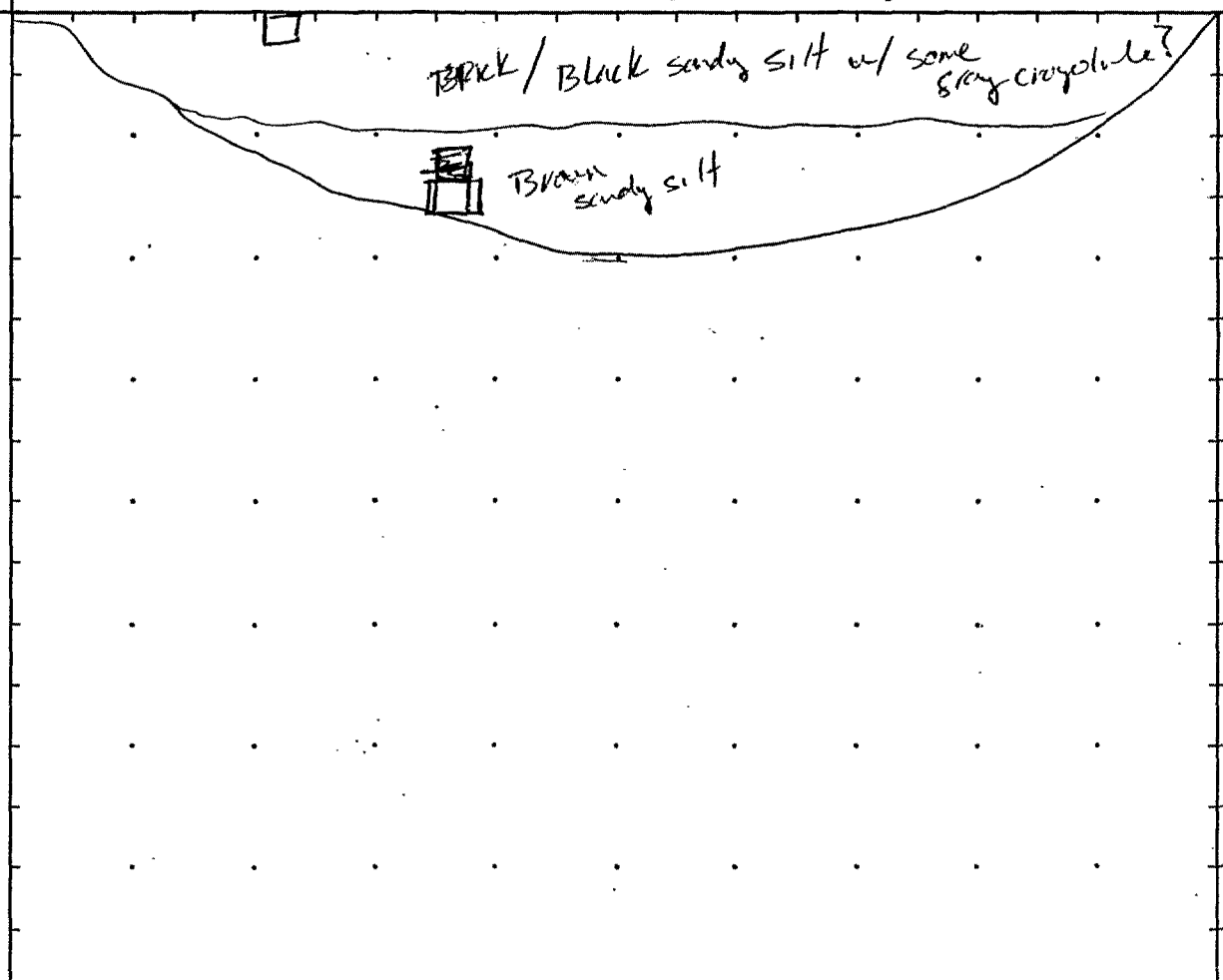
PROJECT RMC Southern POTLiner LOCATION MAP OF W WALL OF PIT

ELEVATION CONTRACTOR STRATUS DATE EXCAVATED 7/21/94

WATER LEVEL AND DATE EXCAVATION METHOD CAT416b LOGGER RWO

APPROXIMATE DIMENSIONS: LENGTH 11 WIDTH 3 DEPTH 3 REMARKS

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		
5		
6		
7		
8		



LENGTH (FT)

COMMENTS

Sampled @ D

REV 7/86 FORM D1599

CH2M HILL

PROJECT NUMBER	TEST PIT NUMBER	
OPE39293.B0.03	SP5	SHEET 1 OF 1

TEST PIT WALL LOG

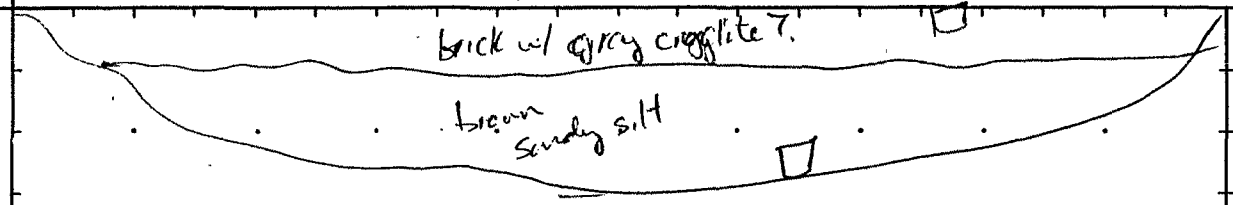
PROJECT RMC Southern Portion LOCATION _____ MAP OF W WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS DATE EXCAVATED 7/21/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT 416b LOGGER Rwo

APPROXIMATE DIMENSIONS: LENGTH _____ WIDTH _____ DEPTH _____ REMARKS _____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		
5		
6		
7		
8		



COMMENTS

Sample @ surface to 3'

LENGTH (FT)

REV 7/86 FORM D1599

CH2MHILL

PROJECT NUMBER	TEST PIT NUMBER	
OPF 39293.BA.03	SP6	SHEET 1 OF 1

TEST PIT WALL LOG

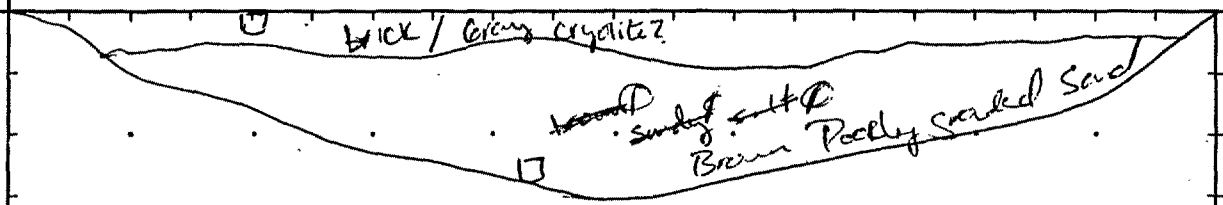
PROJECT RMC Southern Potliner LOCATION _____ MAP OF E WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS DATE EXCAVATED 7/21/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT 416B LOGGER RWO

APPROXIMATE DIMENSIONS: LENGTH 10 WIDTH 3 DEPTH 3 REMARKS _____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		
5		
6		
7		
8		



COMMENTS

Sample @ surface & 3'

LENGTH (FT)

REV 7/86 FORM D1599

CH2MHILL

PROJECT NUMBER	TEST PIT NUMBER	
0PE39293.BD.03	SP7	SHEET 1 OF 1

TEST PIT WALL LOG

PROJECT RMC Southern Potliner LOCATION _____ MAP OF N WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS DATE EXCAVATED 7/21/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT 416b LOGGER RWO

APPROXIMATE DIMENSIONS: LENGTH 11 WIDTH 3 DEPTH 3.5 REMARKS _____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	
1			Black carbon?
2			brown poorly graded sand
3			
4			
5			
6			
7			
8			

COMMENTS

Sampled @ Surface - 2.5'

LENGTH (FT)

REV 7/86 FORM D1599

PROJECT NUMBER	TEST PIT NUMBER	
0RE3723.B0.03	SP8	SHEET 1 OF 1

TEST PIT WALL LOG

PROJECT RMC Southern Portfolio LOCATION _____ MAP OF N WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS DATE EXCAVATED 7/21/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT 416B LOGGER RWS

APPROXIMATE DIMENSIONS: LENGTH 11 WIDTH 3 DEPTH 3.5 REMARKS _____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		

Black carbon?

brown silt w/

brown poorly graded sand

COMMENTS

Sample @ surface & 2.5'

LENGTH (FT)

REV 7/86 FORM D1599

CH2M HILL

PROJECT NUMBER	TEST PIT NUMBER	
OPE.39293.B0.03	SP9	SHEET 1 OF 1

TEST PIT WALL LOG

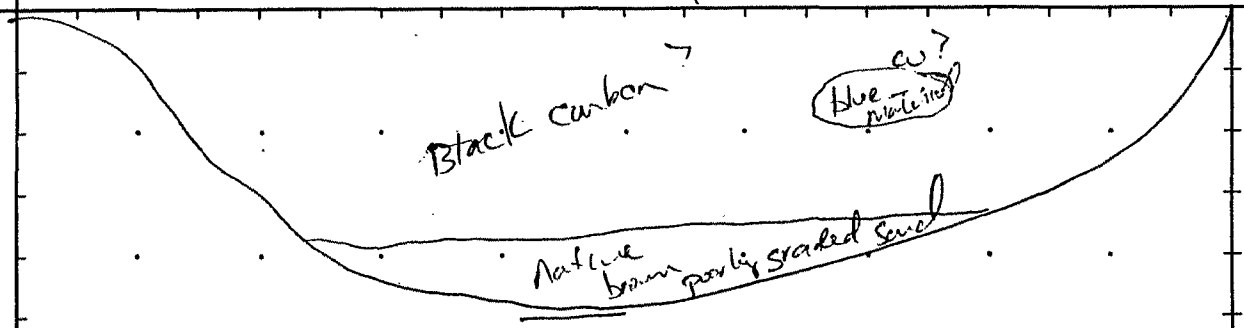
PROJECT RMC Southern Pot Liner LOCATION _____ MAP OF E WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS DATE EXCAVATED 7/21/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT 416b LOGGER RWO

APPROXIMATE DIMENSIONS: LENGTH 6 WIDTH 4 DEPTH 5.0 REMARKS _____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		
5		
6		
7		
8		



LENGTH (FT)

COMMENTS

Sampled @ surface
2.T, 5.0

REV 7/86 FORM D1599

CH2M HILL

PROJECT NUMBER	TEST PIT NUMBER	
OPE39253.B0.03	SP10	SHEET 1 OF 1

TEST PIT WALL LOG

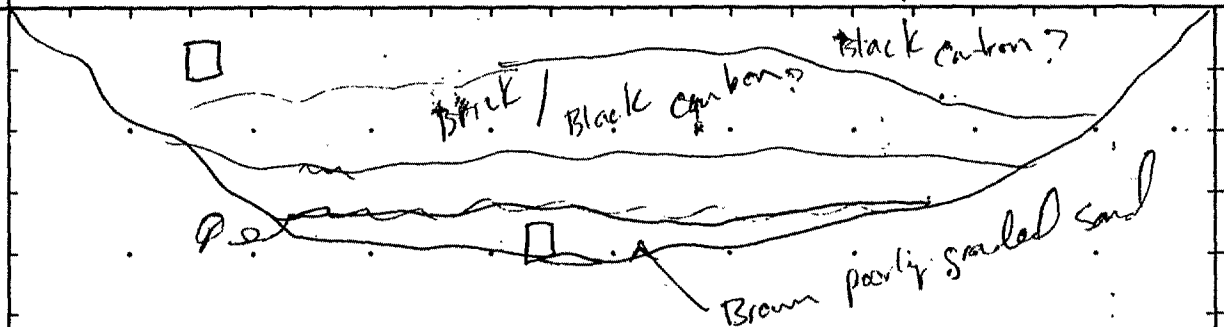
PROJECT RMC Southern Potliner LOCATION _____ MAP OF W WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS DATE EXCAVATED 7/21/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT 416b LOGGER RWO

APPROXIMATE DIMENSIONS: LENGTH 11 WIDTH 3 DEPTH 4 REMARKS _____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		
5		
6		
7		
8		



COMMENTS

Sample @ surface and bottom

LENGTH (FT)

REV 7/86 FORM D1599

PROJECT NUMBER	TEST PIT NUMBER	
OPE 39293.B0.03	SP11	SHEET 1 OF 1

TEST PIT WALL LOG

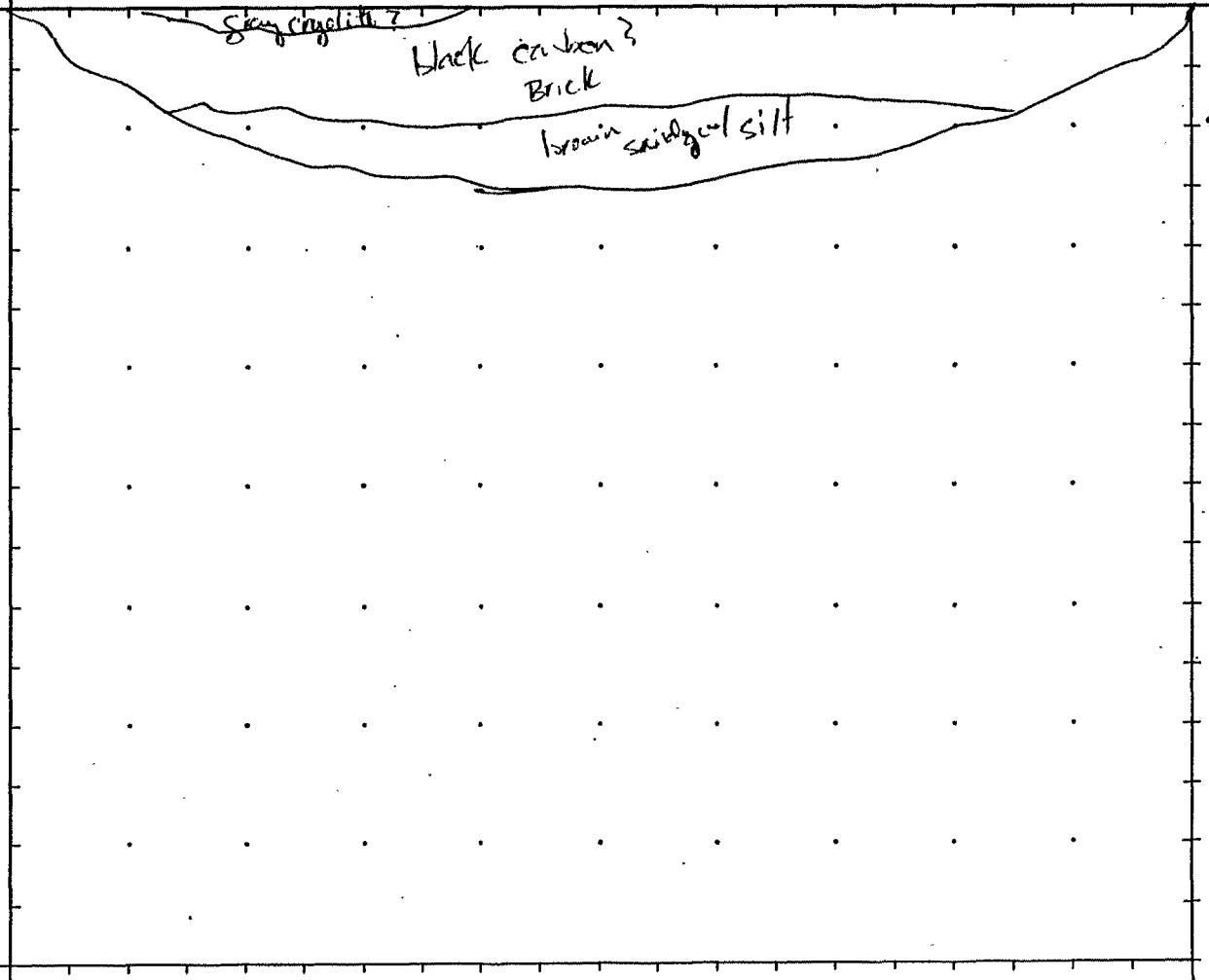
PROJECT RMC Southern Potlines LOCATION _____ MAP OF W WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS DATE EXCAVATED 7/21/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT 416B LOGGER Rev

APPROXIMATE DIMENSIONS: LENGTH 12 WIDTH 3 DEPTH 3 REMARKS _____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		
5		
6		
7		
8		



COMMENTS

Sample @ surface & 2.5'

LENGTH (FT)

REV 7/86 FORM D1599

East Potliner Area

CRMHILL

PROJECT NUMBER	TEST PIT NUMBER	SHEET	OF
OPE 39723.B0.03	EP7	1	1

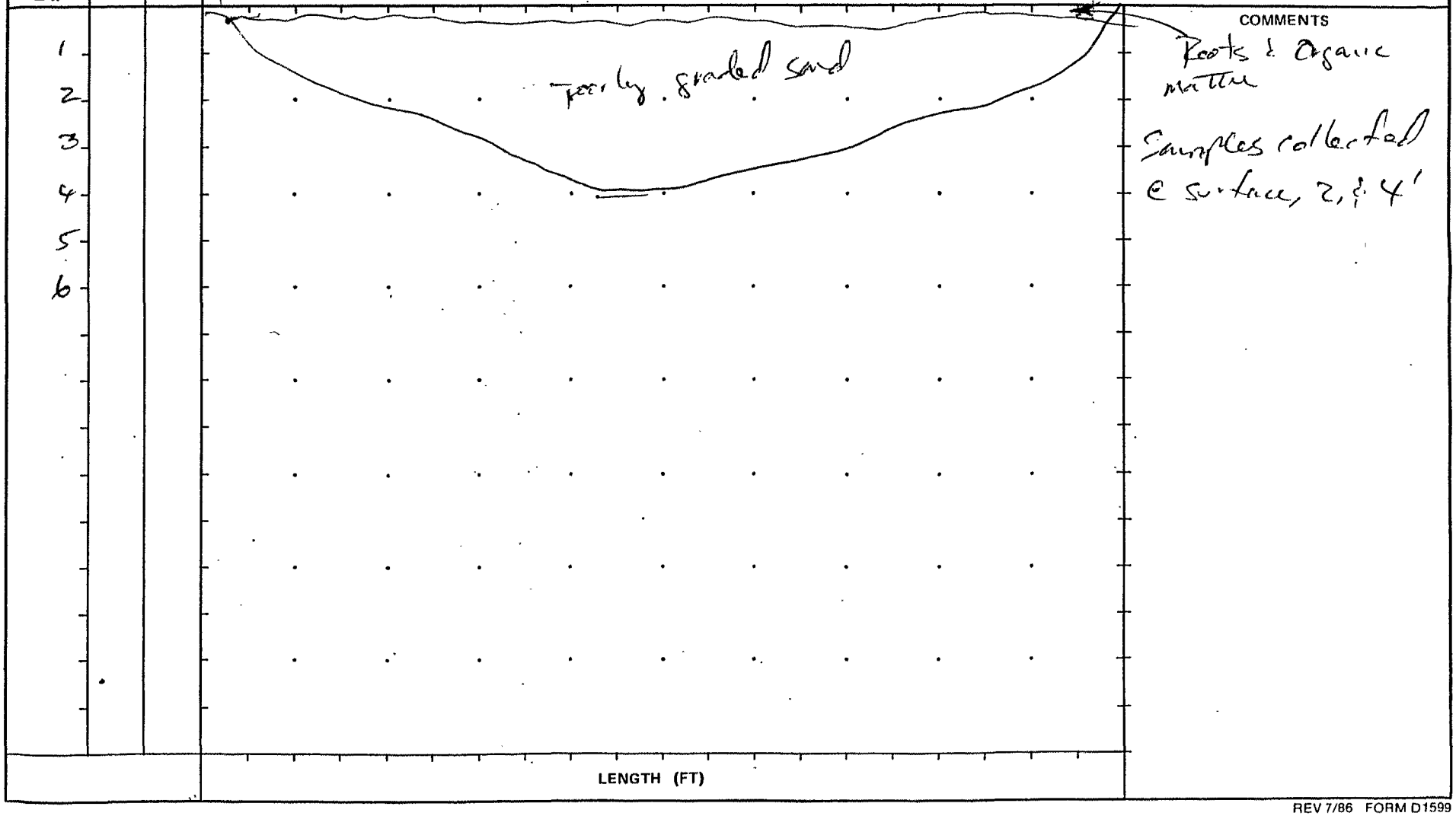
TEST PIT WALL LOG

PROJECT RMC EASTERN Rotliner LOCATION _____ MAP OF W WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS DATE EXCAVATED 7/22/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT 416 LOGGER RWO

APPROXIMATE DIMENSIONS: LENGTH _____ WIDTH _____ DEPTH _____ REMARKS _____



REV 7/86 FORM D1599

CH2M HILL

PROJECT NUMBER	TEST PIT NUMBER	SHEET 1 OF 1
0E39293.B6.03	EP8	

TEST PIT WALL LOG

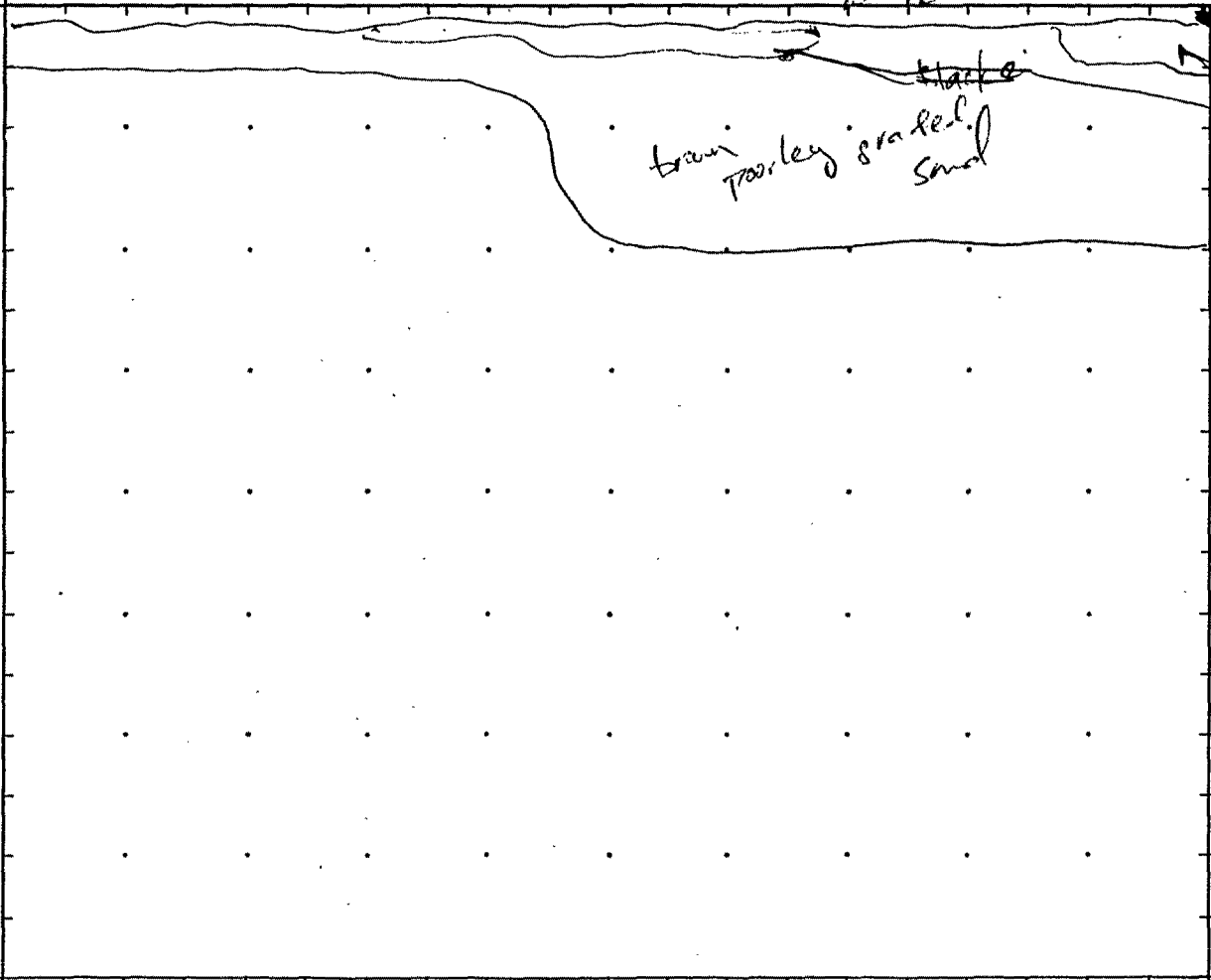
PROJECT RMC EASTERN Pothole LOCATION _____ MAP OF E WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS DATE EXCAVATED 7/22/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT 466 LOGGER DWO

APPROXIMATE DIMENSIONS: LENGTH 22 WIDTH 3 DEPTH 1.0' | 3.0' REMARKS _____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		
5		
6		



COMMENTS

Samples @ surface, 2', and 3'

LENGTH (FT)

REV 7/86 FORM D1599

CH2M HILL

PROJECT NUMBER	TEST PIT NUMBER	
0E3793.B0.03	EP3	SHEET 1 OF 1

TEST PIT WALL LOG

PROJECT RMC EASTERN POTLINER LOCATION _____ MAP OF W WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS DATE EXCAVATED 7/22/94

WATER LEVEL AND DATE 2' @ 7/22/94 EXCAVATION METHOD CAT 416 LOGGER RWO

APPROXIMATE DIMENSIONS: LENGTH 22' WIDTH 3' DEPTH 8' REMARKS: _____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	
1			gray cobbly silty sand; poorly graded sand
2			
3			
4			
5			
6			
7			

COMMENTS

Save 2'

Cobble @ surface ! 2'

LENGTH (FT)

REV 7/86 FORM D1599

CRA/HILL

PROJECT NUMBER	TEST PIT NUMBER	
0PE39293.B0.03	EPT 4	SHEET 1 OF 1

TEST PIT WALL LOG

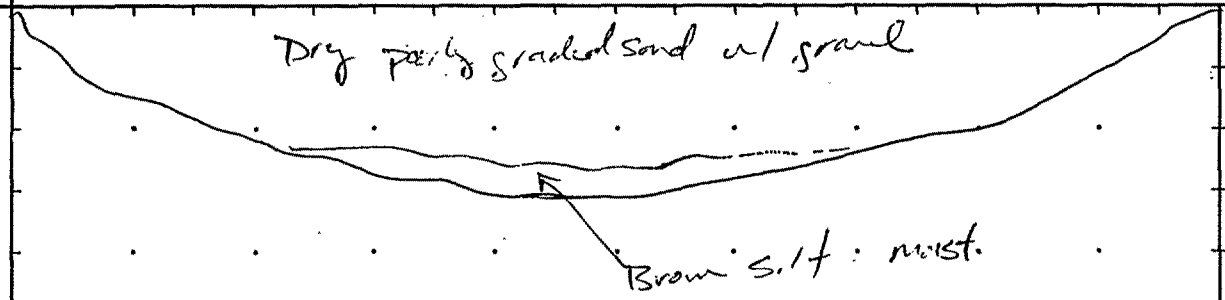
PROJECT RMC EASTERN PIPELINER LOCATION _____ MAP OF E WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS DATE EXCAVATED 7/22/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT 416b LOGGER RWS

APPROXIMATE DIMENSIONS: LENGTH _____ WIDTH _____ DEPTH _____ REMARKS _____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		
5		
6		



COMMENTS

soils becoming moist @ 3'

LENGTH (FT)

REV 7/86 FORM D1599

PROJECT NUMBER	TEST PIT NUMBER	
CPE 3979J.RD.03	EP05	SHEET 1 OF 1

TEST PIT WALL LOG

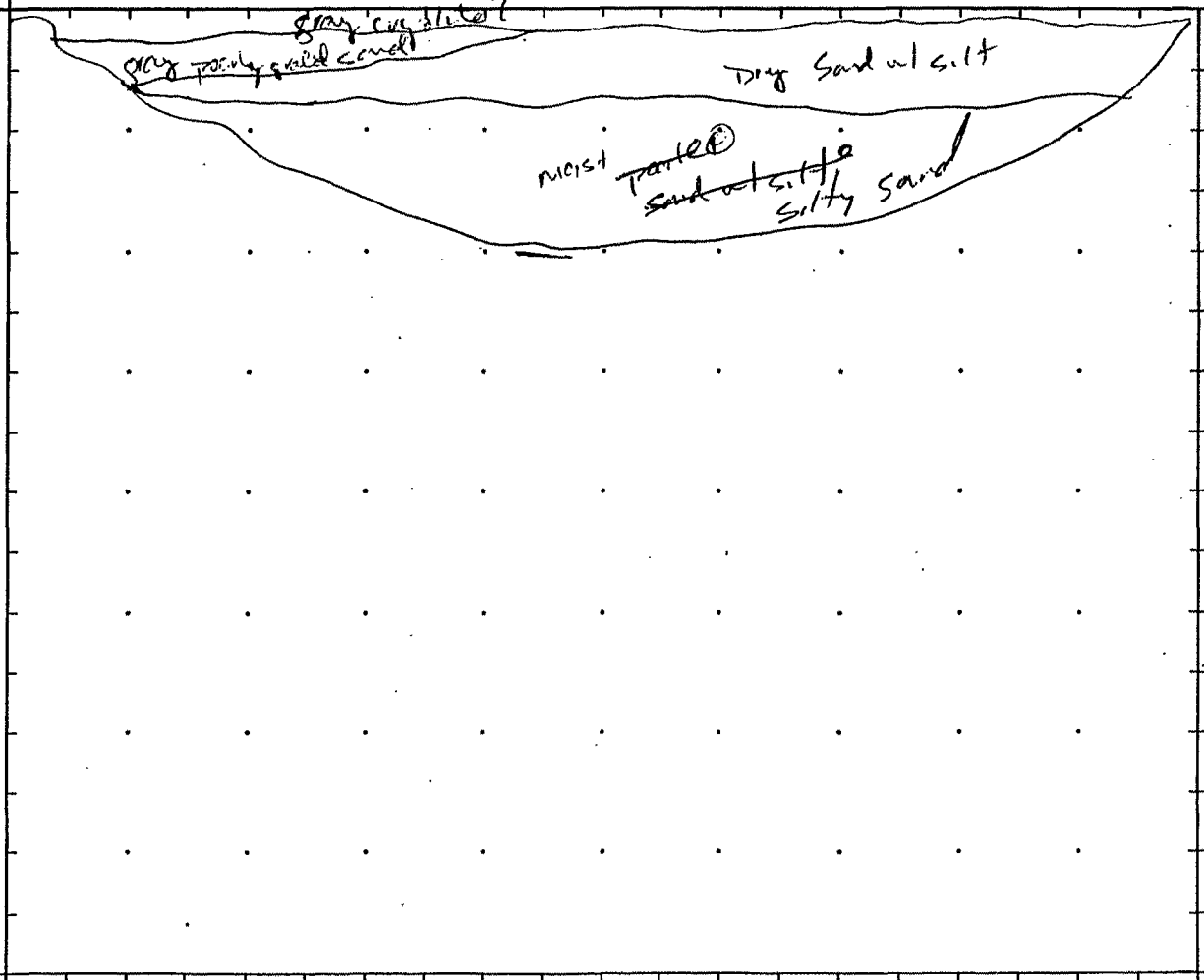
PROJECT RMC EASTERN POLYMER LOCATION _____ MAP OF W WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS DATE EXCAVATED 2/22/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT 446 LOGGER RWJ

APPROXIMATE DIMENSIONS: LENGTH 11 WIDTH 3 DEPTH 4 REMARKS _____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		
5		
6		



LENGTH (FT)

COMMENTS

collect samples @ surface 2, 4 feet

Tight soils to 4'

CRMHILL

PROJECT NUMBER	TEST PIT NUMBER	
0PE3979.B0.03	EP6	SHEET 1 OF 1

TEST PIT WALL LOG

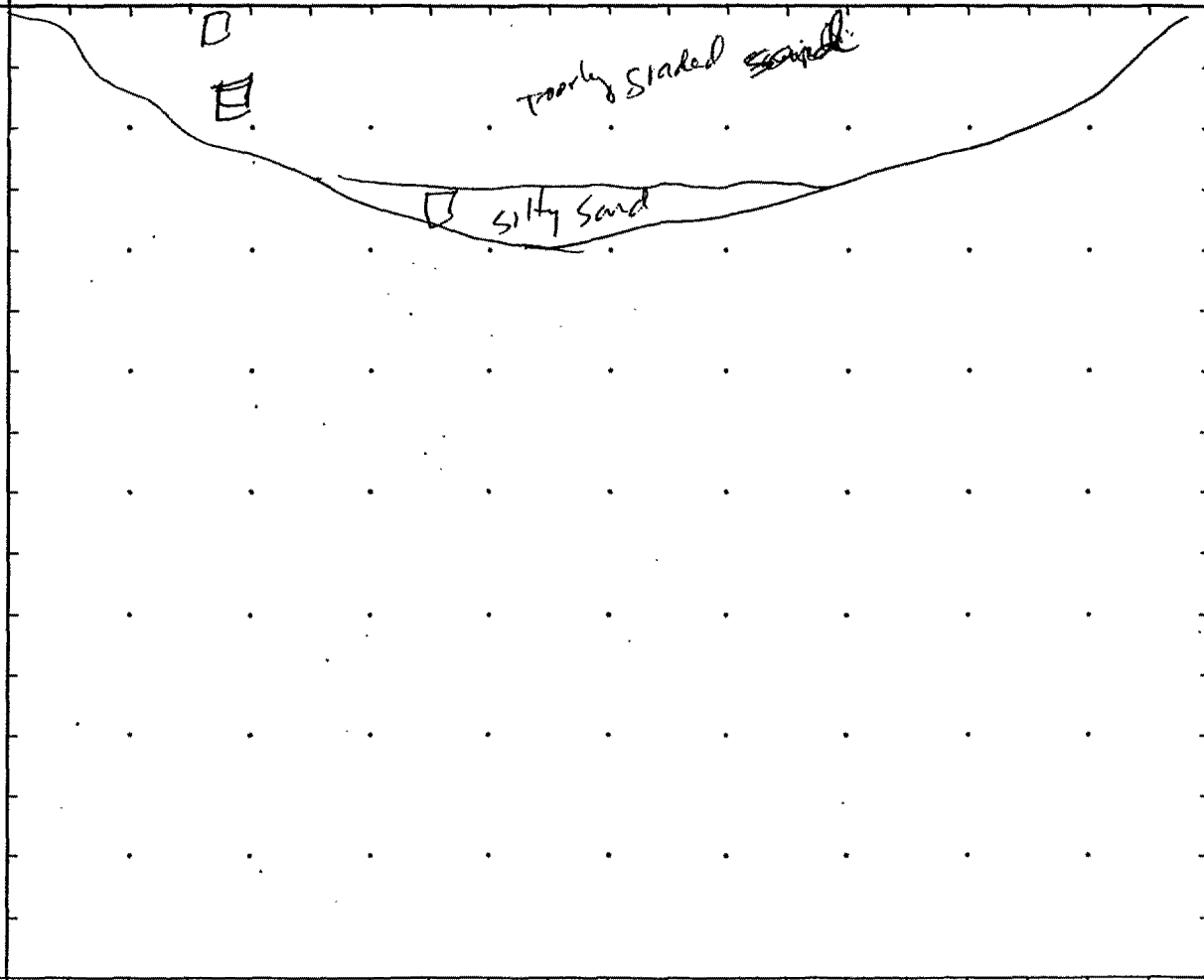
PROJECT PUC EASTERN PS LINER LOCATION MAP OF E WALL OF PIT

ELEVATION CONTRACTOR STRATUS DATE EXCAVATED 7/22/94

WATER LEVEL AND DATE EXCAVATION METHOD CAT 466 LOGGER RWO

APPROXIMATE DIMENSIONS: LENGTH 11 WIDTH 3 DEPTH 4 REMARKS

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		
5		
6		



LENGTH (FT)

COMMENTS

Sample @ Surface
2' and 4'

REV 7/86 FORM D1599

PROJECT NUMBER	TEST PIT NUMBER	
OPE39793.B0.03	EP7	SHEET 1 OF 1

TEST PIT WALL LOG

PROJECT RMC EASTERN Pot Liner LOCATION _____ MAP OF E WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS DATE EXCAVATED 7 Dec 94

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT 416 LOGGER Reno

APPROXIMATE DIMENSIONS: LENGTH 12 WIDTH 3 DEPTH 3 REMARKS _____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	COMMENTS
1			Slag cyclone ?
2			moist poorly graded sand
3			moist silt (fill)
4			
5			
6			

LENGTH (FT)

REV 7/86 FORM D1599

CH2M HILL

PROJECT NUMBER	TEST PIT NUMBER	
ONE3923.B0.03	EP8	SHEET 1 OF 1

TEST PIT WALL LOG

PROJECT RMC EASTERN Bottles LOCATION _____ MAP OF W WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS DATE EXCAVATED 7/22/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT 416 LOGGER RWD

APPROXIMATE DIMENSIONS: LENGTH 11 WIDTH 3 DEPTH 3 REMARKS _____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	
1			poorly graded sand
2			
3			Fractured
4			
5			
6			

COMMENTS

Slag cryolite ?

Sample @ surface, 2' and 3'

LENGTH (FT)

REV 7/86 FORM D1599

Scrap Yard

CH2MHILL

PROJECT NUMBER	TEST PIT NUMBER	
OPE39253.E0.01	SY1	SHEET 1 OF 1

TEST PIT WALL LOG

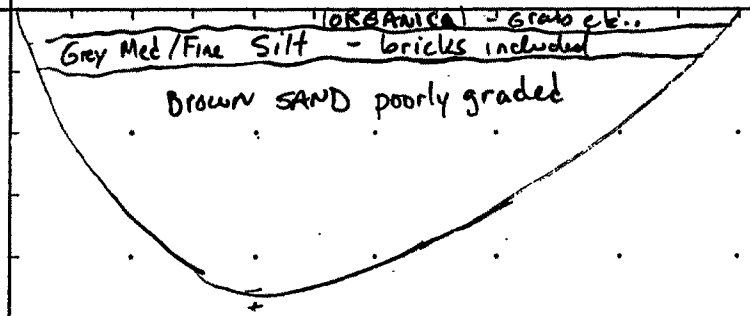
PROJECT RMC SCRAP YARD LOCATION _____ MAP OF _____ WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS DATE EXCAVATED 7/25/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT 416b LOGGER ~~Bob~~ SFO

APPROXIMATE DIMENSIONS: LENGTH 11 WIDTH 2.5 DEPTH 4.5 REMARKS LOOKING @ SOUTH WALL

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		
5		



COMMENTS

SAMPLE @ Surface, ~~2.5~~, 2.0
4.5

LENGTH (FT)

REV 7/86 FORM D1599

CH2M HILL

PROJECT NUMBER	TEST PIT NUMBER
FPE39293 B0.01	SY2 SHEET 1 OF 1

TEST PIT WALL LOG

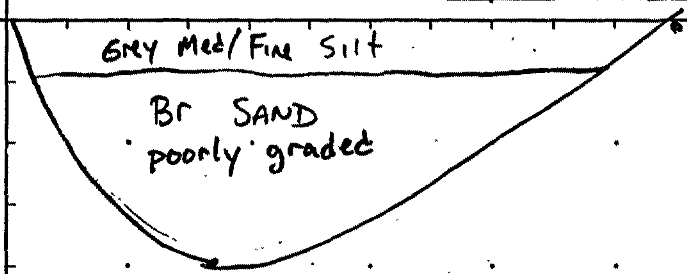
PROJECT RMC SCRAP YARD LOCATION ______ MAP OF ______ WALL OF PIT

ELEVATION ______ CONTRACTOR [illegible] DATE EXCAVATED 7/25/94

WATER LEVEL AND DATE ______ EXCAVATION METHOD CAT 416B LOGGER ~~[illegible]~~ SFO

APPROXIMATE DIMENSIONS: LENGTH 11 WIDTH 2.5 DEPTH 4 REMARKS LOOKING at S. WALL

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		



LENGTH (FT)

COMMENTS

SAMPLE @ Surf, ~~2.5~~ 2.0, 4, composite

REV 7/86 FORM D1599

CH2M HILL

PROJECT NUMBER	TEST PIT NUMBER	
OPE39293.BC #1	SY3	SHEET 1 OF 1

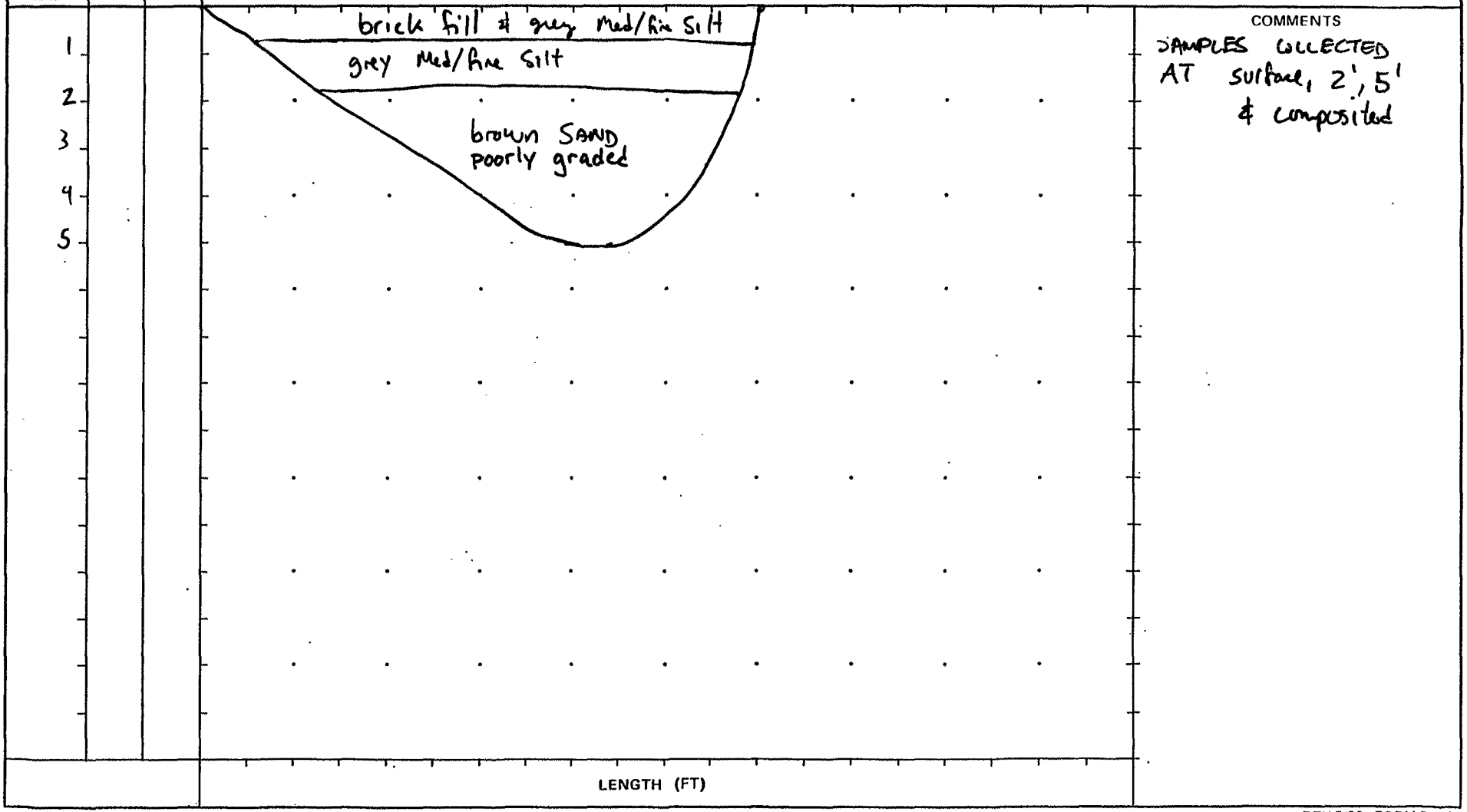
TEST PIT WALL LOG

PROJECT Rail SCRAP YARD LOCATION _____ MAP OF _____ WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS DATE EXCAVATED 7/25/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT 416b LOGGER ~~BC~~ SFO

APPROXIMATE DIMENSIONS: LENGTH 12 WIDTH 2.5 DEPTH 5 REMARKS View of North WALL



COMMENTS

SAMPLES COLLECTED AT surface, 2', 5' & composited

REV 7/86 FORM D1599

PROJECT NUMBER	TEST PIT NUMBER	
CPE 39793.	SY4	SHEET 1 OF 1

TEST PIT WALL LOG

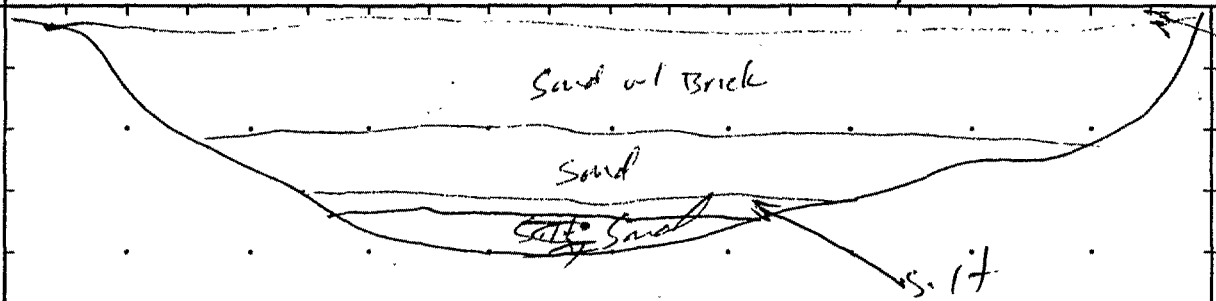
PROJECT Pike SCRAP YARD LOCATION _____ MAP OF E WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS DATE EXCAVATED 7/24/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT 416b LOGGER RWS

APPROXIMATE DIMENSIONS: LENGTH 12 WIDTH 4 DEPTH 4 REMARKS _____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		
5		



COMMENTS

Gray pollution?

Sample @ surface 2, and 4'

LENGTH (FT)

REV 7/86 FORM D1599

CH2M HILL

PROJECT NUMBER	TEST PIT NUMBER
018 39293 [illegible]	SYS SHEET 1 OF 1

TEST PIT WALL LOG

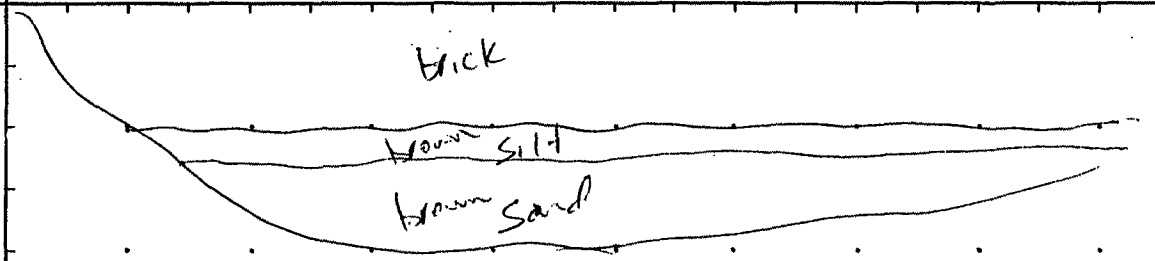
PROJECT KMC SCRAP YARD LOCATION _____ MAP OF E WALL OF PIT

ELEVATION _____ CONTRACTOR SIERRA DATE EXCAVATED 7/24/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT 416B LOGGER RCD

APPROXIMATE DIMENSIONS: LENGTH 12 WIDTH 4 DEPTH 4 REMARKS _____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		
5		



COMMENTS

Sampled @ Surface, 2' & 4'

LENGTH (FT)

REV 7/86 FORM D1599

CH2M HILL

PROJECT NUMBER	TEST PIT NUMBER	
CPE 39293.B0.01	SY6	SHEET 1 OF 1

TEST PIT WALL LOG

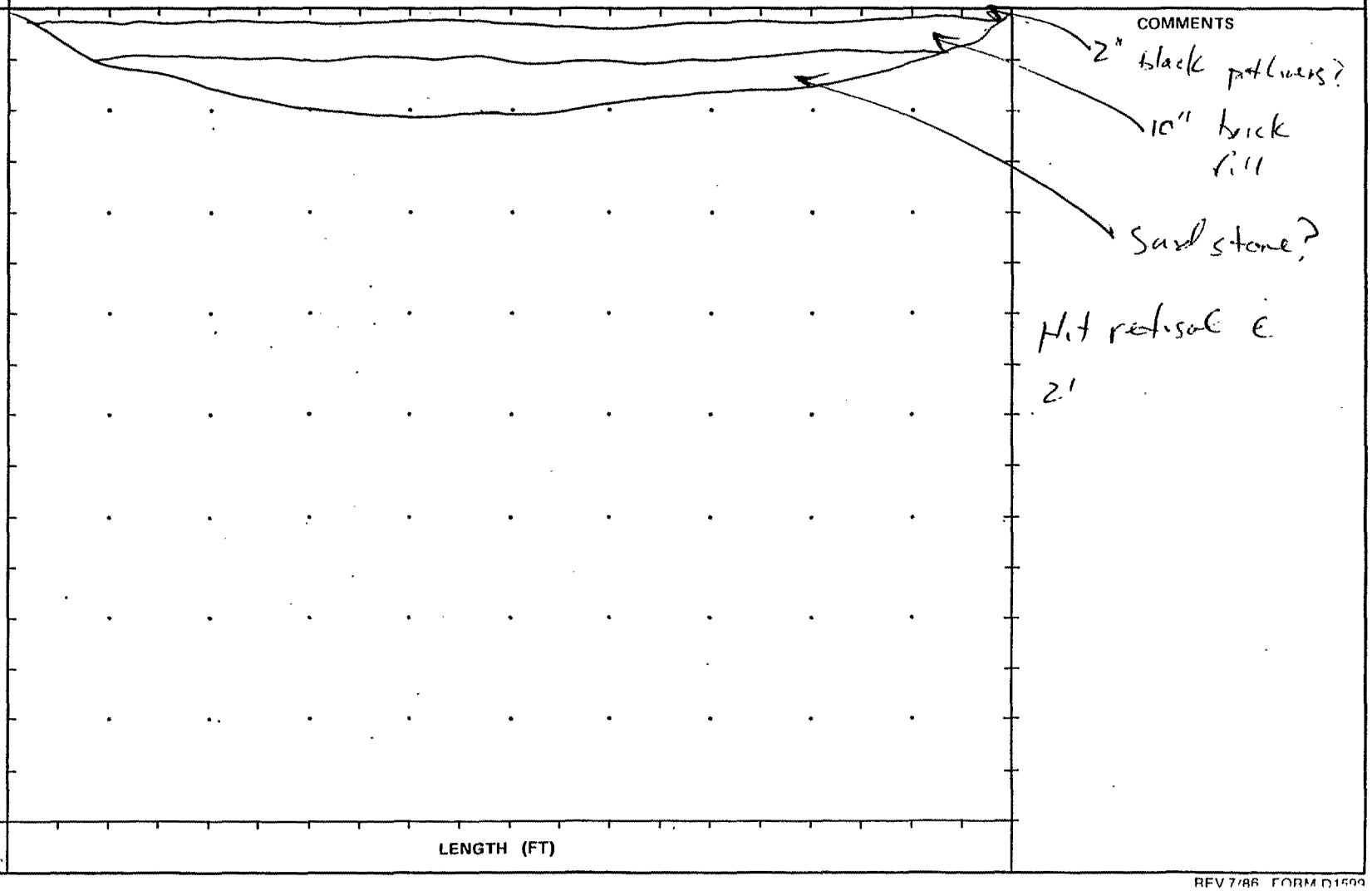
PROJECT RMC SCRAP YARD LOCATION _____ MAP OF _____ WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS DATE EXCAVATED 7/24/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT 416B LOGGER RWO

APPROXIMATE DIMENSIONS: LENGTH 12 WIDTH 4 DEPTH 2 REMARKS _____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		



REV 7/86 FORM D1599

PROJECT NUMBER	TEST PIT NUMBER	
SFE.37293 BX.01	SY7	SHEET 1 OF 1

TEST PIT WALL LOG

PROJECT LMC SCRAP YARD LOCATION _____ MAP OF E WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS DATE EXCAVATED 7/24/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT 416b LOGGER RLC

APPROXIMATE DIMENSIONS: LENGTH 6' WIDTH 3 DEPTH 1.5' REMARKS _____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	COMMENTS
1			poly liner / tank ?
2			
3			hard soil stone ?

LENGTH (FT)

REV 7/86 FORM D1599

CH2M HILL

PROJECT NUMBER	TEST PIT NUMBER
112392.59.01	SYE

SHEET 1 OF 1

TEST PIT WALL LOG

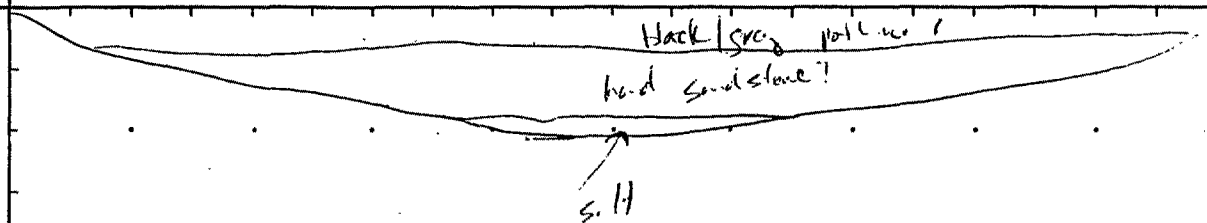
PROJECT Knik Scenic Yard LOCATION _____ MAP OF E WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS DATE EXCAVATED 7/24/84

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT 416B LOGGER Rue

APPROXIMATE DIMENSIONS: LENGTH 4 WIDTH 3 DEPTH 2 REMARKS _____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		



COMMENTS

Sample @ surface and 2'

LENGTH (FT)

REV 7/86 FORM D1599

CRMHILL

PROJECT NUMBER	TEST PIT NUMBER	
CRK 39293.BQ.01	SY9	SHEET 1 OF 1

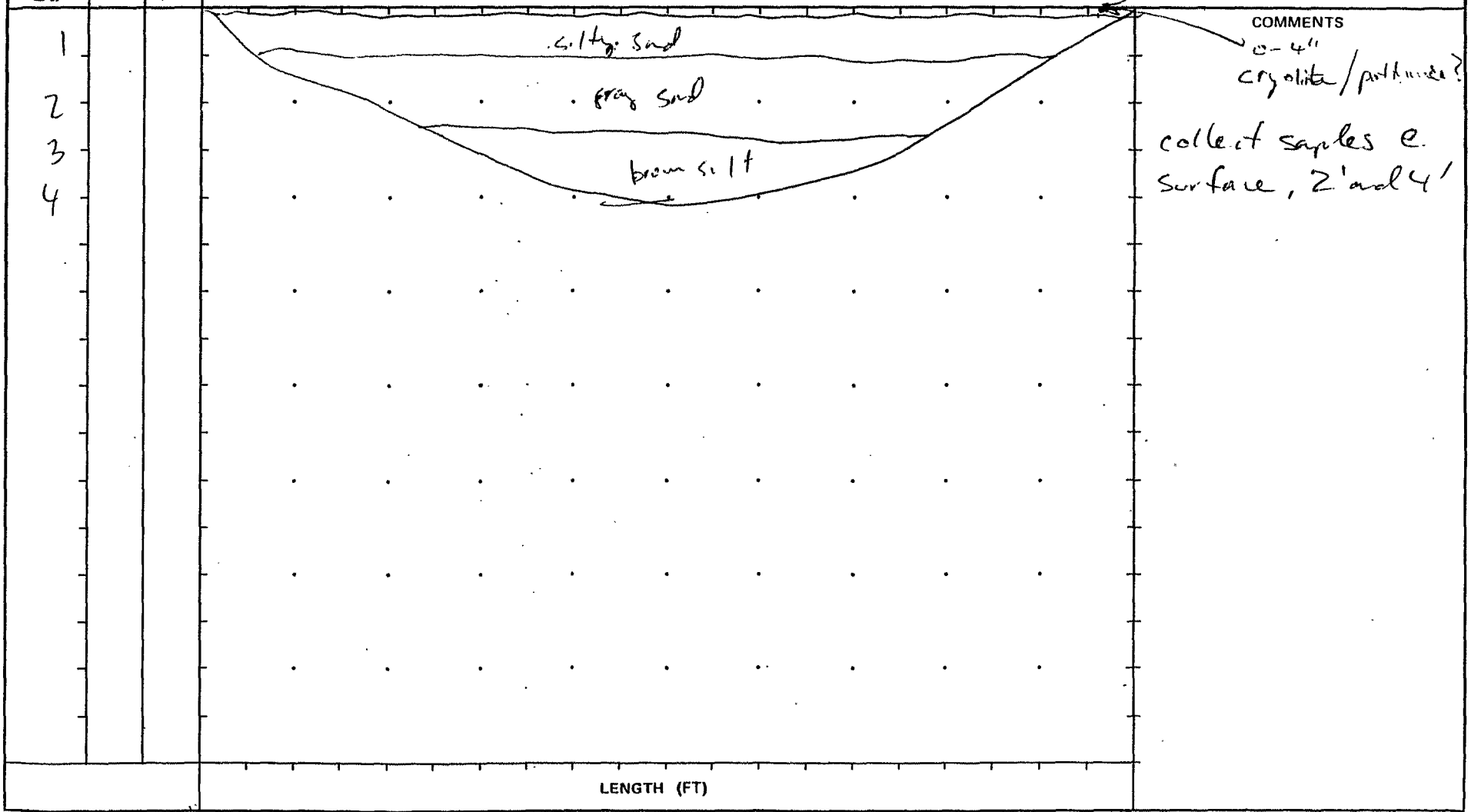
TEST PIT WALL LOG

PROJECT RMC SCRAPYARDS LOCATION _____ MAP OF W WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS DATE EXCAVATED 7/24/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT416B LOGGER RWO

APPROXIMATE DIMENSIONS: LENGTH 17 WIDTH 3 DEPTH 4 REMARKS _____



REV 7/86 FORM D1599

CRA HILL

PROJECT NUMBER	TEST PIT NUMBER	
66239293.B0.02	SY10	SHEET 1 OF 1

TEST PIT WALL LOG

PROJECT KAIC SCRAP YARD LOCATION MAP OF N WALL OF PIT

ELEVATION CONTRACTOR SYCAMORE DATE EXCAVATED 7/24/94

WATER LEVEL AND DATE EXCAVATION METHOD CAT 416B LOGGER KWO

APPROXIMATE DIMENSIONS: LENGTH 12 WIDTH 3 DEPTH 4 REMARKS

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	
1			gray sand
2			
3			brown silt
4			

COMMENTS

pot liner? cryolite?

Sample @ surface 2' and 4'

LENGTH (FT)

REV 7/86 FORM D1599

CH2MHILL

PROJECT NUMBER	TEST PIT NUMBER
CPE 39273.50.01	SY11 SHEET 1 OF 1

TEST PIT WALL LOG

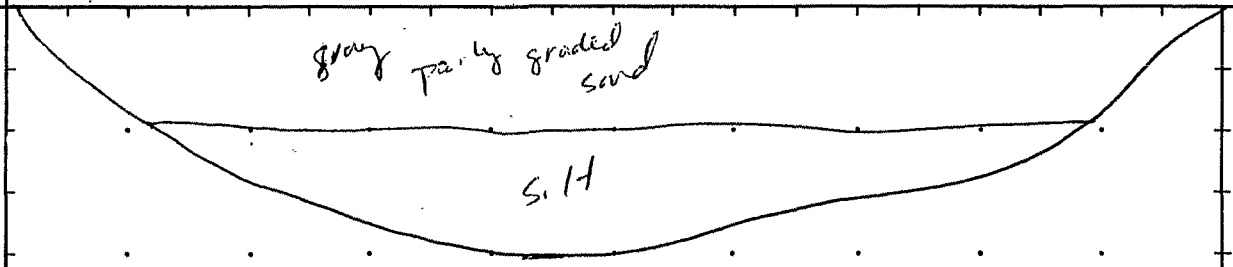
PROJECT Rail Scrap Yard LOCATION _____ MAP OF S WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS DATE EXCAVATED 7/26/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT 416C LOGGER RWO

APPROXIMATE DIMENSIONS: LENGTH 12 WIDTH 4 DEPTH 4 REMARKS _____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		



LENGTH (FT)

COMMENTS

Samples collected @ surface, 2', 4'

REV 7/86 FORM D1599

CRA HILL

PROJECT NUMBER	TEST PIT NUMBER	
61E 39293.20.01	S412	SHEET 1 OF 1

TEST PIT WALL LOG

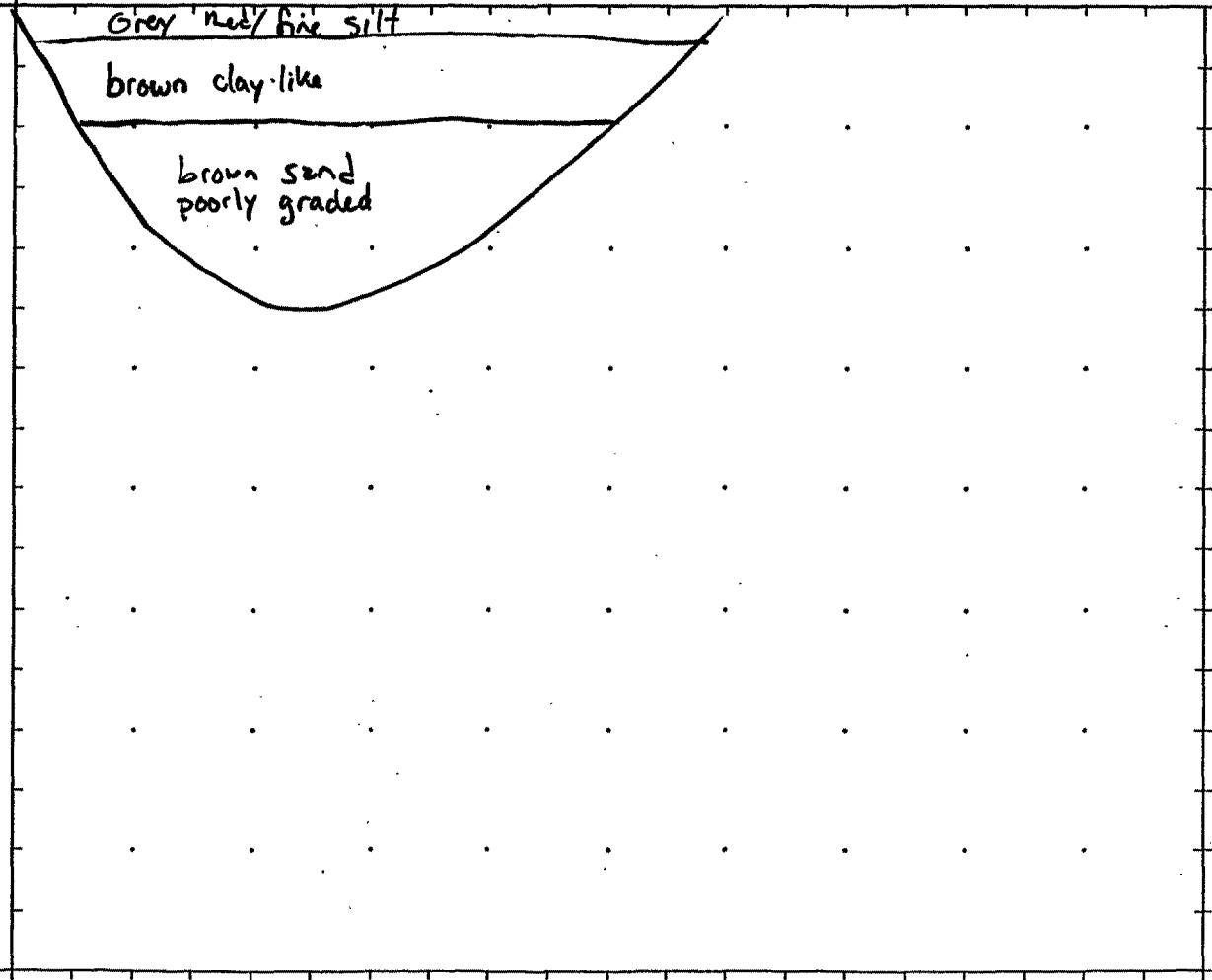
PROJECT KULC SCRAP YARD LOCATION _____ MAP OF _____ WALL OF PIT

ELEVATION _____ CONTRACTOR SHEETS DATE EXCAVATED 1/24/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT 416 LOGGER KCC

APPROXIMATE DIMENSIONS: LENGTH 12' WIDTH 2.5' DEPTH 5' REMARKS LOOKING NORTH

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		
5		



COMMENTS

SAMPLES TAKEN

LENGTH (FT)

REV 7/86 FORM D1599

CRA/HILL

PROJECT NUMBER	TEST PIT NUMBER	
CPE39253.BD.01	SY13	SHEET 1 OF 1

TEST PIT WALL LOG

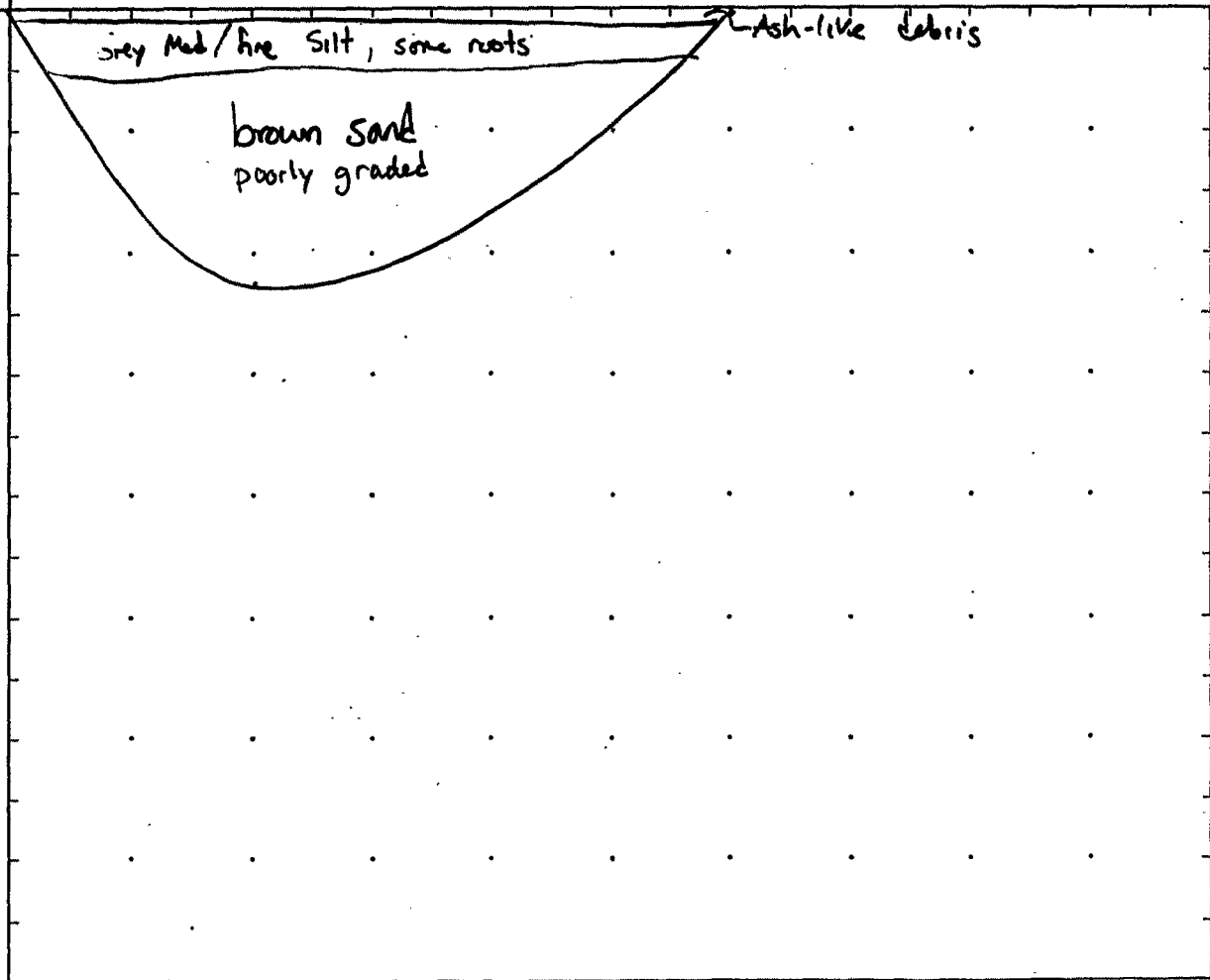
PROJECT PHLC SCRAP YARD LOCATION _____ MAP OF _____ WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS DATE EXCAVATED 7/25/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT 416B LOGGER ~~KMD~~ SFO

APPROXIMATE DIMENSIONS: LENGTH 12 WIDTH 2.5 DEPTH 4.5 REMARKS LOOKING WEST

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		
5		



LENGTH (FT)

COMMENTS

SAMPLES TAKEN @ SURFACE, 2.0', 4.5' & COMPOSITE

REV 7/86 FORM D1599

CH2M HILL

PROJECT NUMBER	TEST PIT NUMBER	
39293.ED.01	SY14	SHEET 1 OF 1

TEST PIT WALL LOG

PROJECT RMC SCRAP YARD LOCATION MAP OF WALL OF PIT

ELEVATION CONTRACTOR STRATUS DATE EXCAVATED 7/24/94

WATER LEVEL AND DATE EXCAVATION METHOD CAT 416B LOGGER RW

APPROXIMATE DIMENSIONS: LENGTH 12 WIDTH 2.5' DEPTH 4' REMARKS SOUTH SIDE VIEW OF WALL

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		

Well ~~Poorly~~ Graded / fill (bricks)

Grey Mud / fine Silt

brown Sand poorly graded

COMMENTS

SAMPLES @ Surface, 2', 4', composite

some leaching visible in 1-2 foot section of brown sand

LENGTH (FT)

REV 7/86 FORM D1599

CH2M HILL

PROJECT NUMBER	TEST PIT NUMBER	
OFE 39293.B0.01	SY15	SHEET 1 OF 1

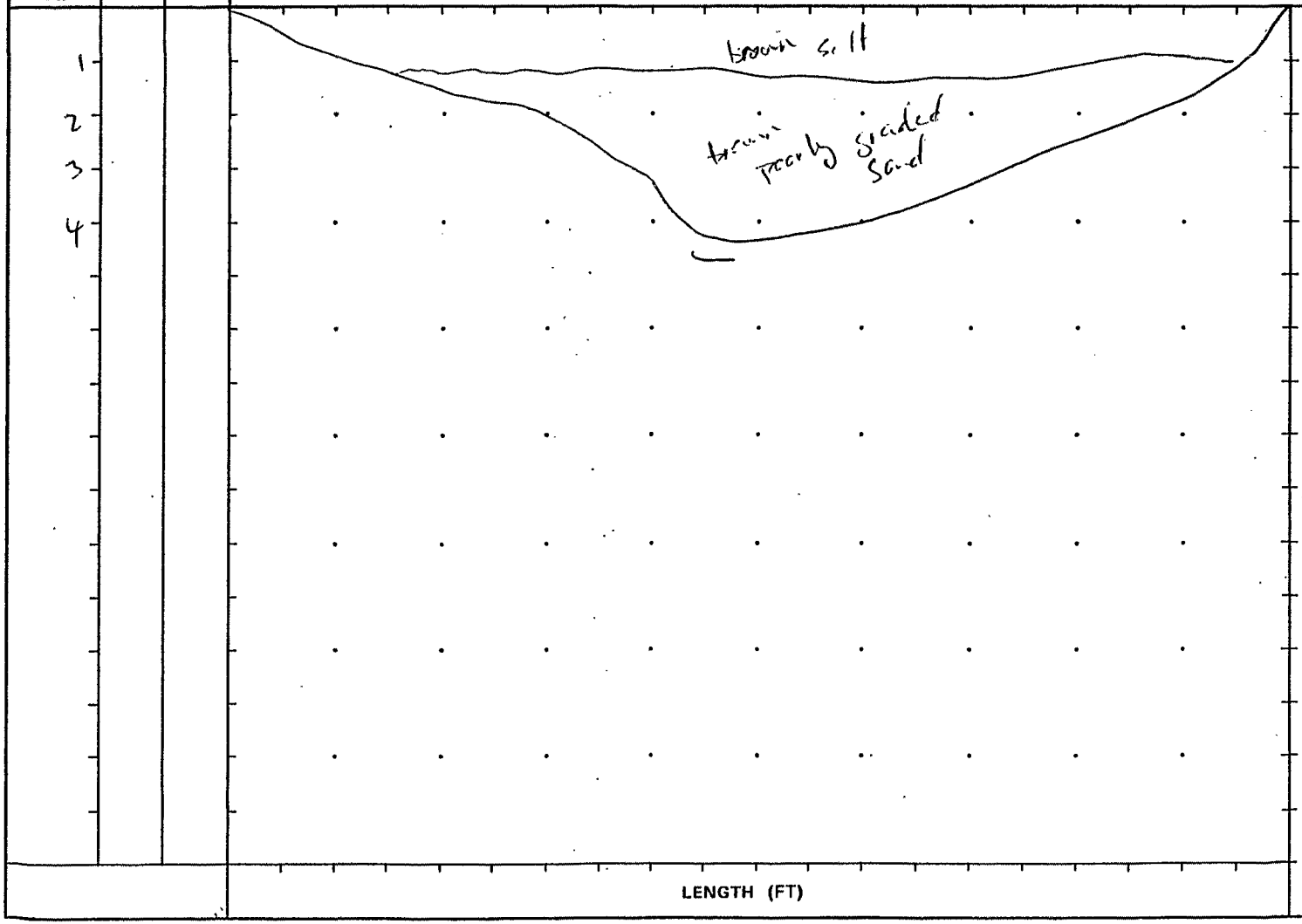
TEST PIT WALL LOG

PROJECT KLLC SCRAP YARD LOCATION _____ MAP OF S WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS DATE EXCAVATED 7/25/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT 416b LOGGER Ross

APPROXIMATE DIMENSIONS: LENGTH 12 WIDTH 3 DEPTH 4 REMARKS _____



COMMENTS

samples collected @ surface, 2, and 4'

REV 7/86 FORM D1599

Miscellaneous Areas

CRMHILL

PROJECT NUMBER	TEST PIT NUMBER	
OPE39293.B5.02	WF-1	SHEET 1 OF

TEST PIT WALL LOG

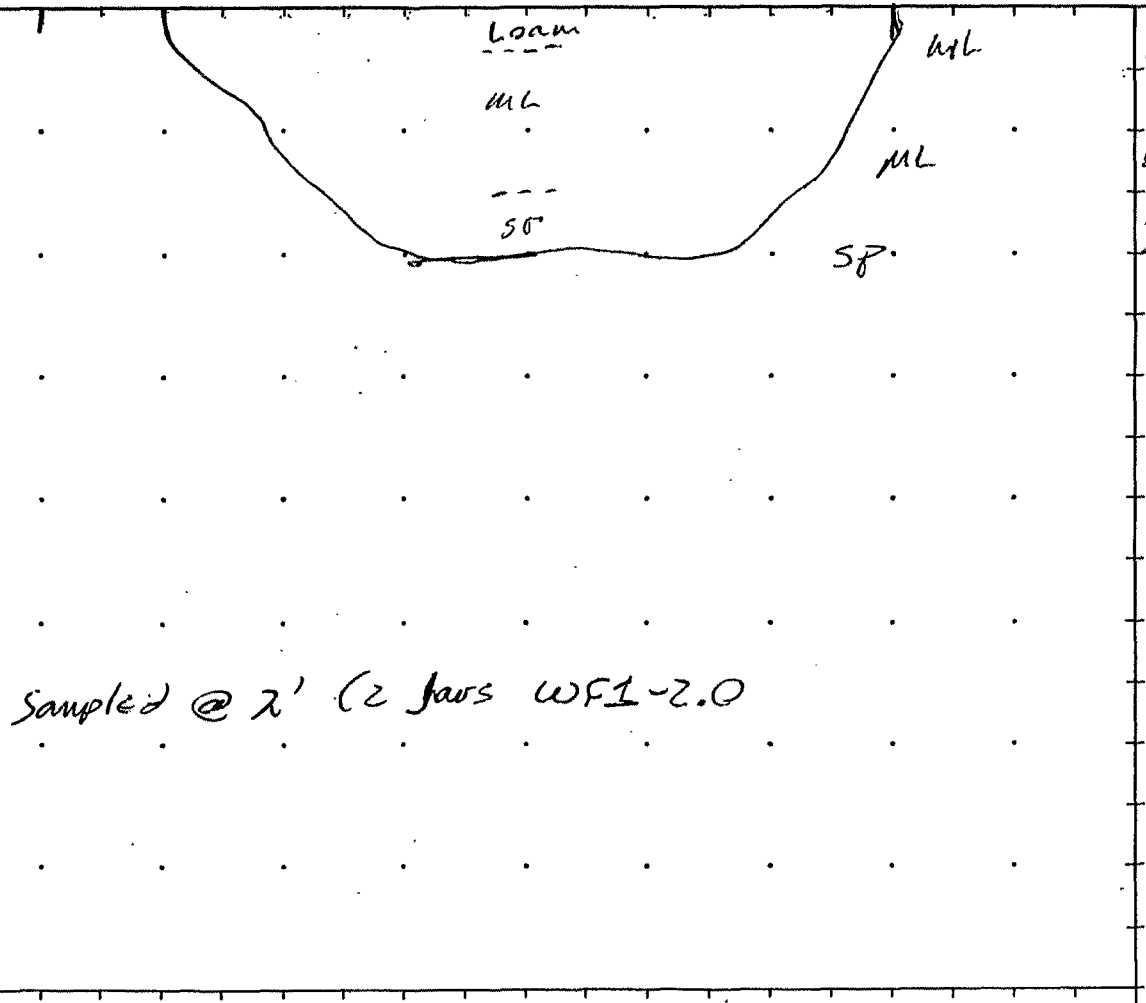
PROJECT RMC-TROUTDALE LOCATION WEST FIELD MAP OF E WALL OF PIT

ELEVATION U.K. CONTRACTOR STRATUS CORP DATE EXCAVATED 9/23/92

WATER LEVEL AND DATE NONE ENCT'D EXCAVATION METHOD CAT TURBO 160 BH LOGGER P. BROWN

APPROXIMATE DIMENSIONS: LENGTH 12' WIDTH 3' DEPTH 4' REMARKS NOTE: NO DEBRIS NOTED

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		



LENGTH (FT)

COMMENTS

0-1 Loamy S.A w/Gravel CML

2-3 S.A w/Clay (ML) Brown, Fine, Dry, Fine 10% Clay

3-4 - Sand, Brown, med-Fine, Dry, Soft Loose

REV 7/86 FORM D1599

CH2M HILL

PROJECT NUMBER	TEST PIT NUMBER	SHEET	OF
	WF-2	1	

TEST PIT WALL LOG

PROJECT RMC-T LOCATION WEST FIELD, Middle Pit MAP OF E WALL OF PIT

ELEVATION — CONTRACTOR STATUS DATE EXCAVATED 9/23/94

WATER LEVEL AND DATE NONE EXCAVATION METHOD CAT B.M. LOGGER P. Brown

APPROXIMATE DIMENSIONS: LENGTH 13.0' WIDTH 3.0 DEPTH 3.0 REMARKS

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	
1			Roots / organic matter
2			silty sand w/ gravel up to 6" dia
3			Silt
4			Silty Sand

COMMENTS

Loamy Silt w/ gravel (ML) at SFC.

Sample @ 1.5'-2.0'

LENGTH (FT)

REV 7/86 FORM D1599

PROJECT NUMBER	TEST PIT NUMBER	SHEET	OF
	WF3		

TEST PIT WALL LOG

PROJECT RMC-1 LOCATION WEST FIELD, EAST Pit MAP OF E WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS DATE EXCAVATED 9/23/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT B.H. LOGGER D. Brown

APPROXIMATE DIMENSIONS: LENGTH 12 WIDTH 4 DEPTH 3 REMARKS _____

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	COMMENTS
1			Sample @ 1.5-2.0'
2			
3			
4			

Roots / organic matter

gravel w/ silt 6"-

silt

silt w/ sand

LENGTH (FT)

REV 7/86 FORM D1599

CH2M HILL

PROJECT NUMBER	TEST PIT NUMBER	
OPE39293	UTL-N	SHEET 1 OF 1

TEST PIT WALL LOG

PROJECT Reynolds Metals LOCATION (UTL-N) MAP OF N WALL OF PIT

ELEVATION _____ CONTRACTOR Stratus Corp DATE EXCAVATED 9/13/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD Cat 416b LOGGER Rud

APPROXIMATE DIMENSIONS: LENGTH 15 WIDTH 4 DEPTH 4 REMARKS No Caps

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	
1			silt w/ some debris
2			brick w/ construction debris
3			large concrete slabs.
4			
5			silty soil

COMMENTS

LENGTH (FT)

REV 7/86 FORM D1599

CH2M HILL

PROJECT NUMBER	TEST PIT NUMBER	
OPE39293.	UTL-S	SHEET 1 OF 1

TEST PIT WALL LOG

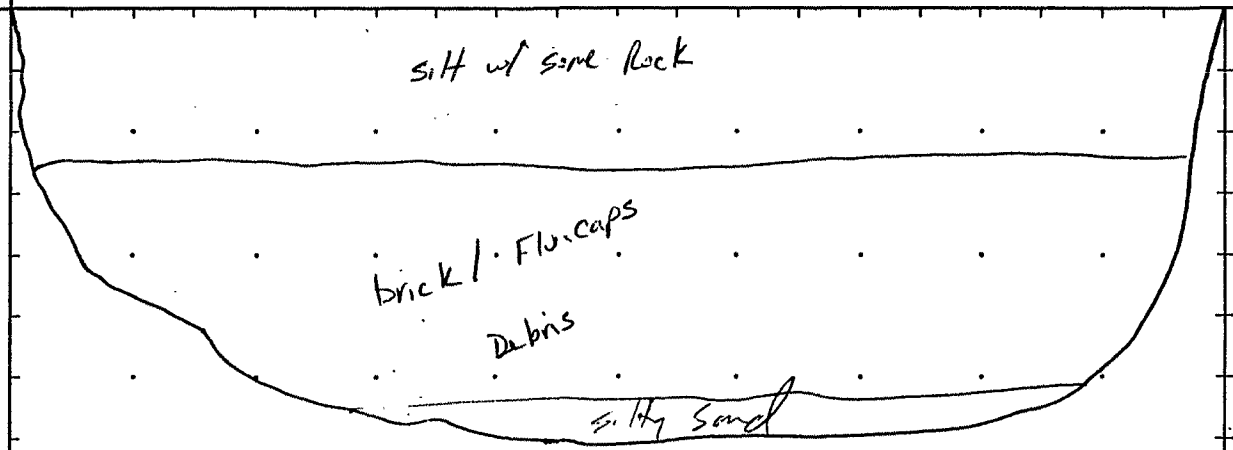
PROJECT REYNOLDS METALS LOCATION (UTL-S) MAP OF S WALL OF PIT

ELEVATION _____ CONTRACTOR STRATUS Corp DATE EXCAVATED 9/13/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT 416b LOGGER Rud

APPROXIMATE DIMENSIONS: LENGTH 15 WIDTH 4 DEPTH 7 REMARKS No Caps

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		



COMMENTS

UTL-S ⇒ UNDER TRANSMISSION LINES, southern pit.

LENGTH (FT)

REV 7/86 FORM D1599

Geoprobe Borings

PROJECT NUMBER	BORING NUMBER	
NE3993.BD.03	P1	SHEET 1 OF 1

SOIL BORING LOG

PROJECT RMC EAST PARKING LOT LOCATION P1

ELEVATION _____ DRILLING CONTRACTOR Geo-Tech Explorations

DRILLING METHOD AND EQUIPMENT CME-Pickup

WATER LEVELS _____ START 7/25/94 FINISH 7/25/94 LOGGER [illegible]

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
1	1.0'					
2	3.0'	G-1	1.1'	NA	brown silt 7", brown sand 6"	
3						
4	5.0	G-2	1.5'	NA	brown silty SAND	
5						
6	7.0	G-3	1.5'		brown sand	
7						
8						0913 backfill hole.

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
0E39.93.B0 03	P3	1	1

SOIL BORING LOG

PROJECT RMC EAST PARKING LOT LOCATION P3

ELEVATION _____ DRILLING CONTRACTOR GEO-TECH EXPLORATIONS

DRILLING METHOD AND EQUIPMENT GEO-Probe

WATER LEVELS _____ START 7/25/94 FINISH 7/25/94 LOGGER [illegible]

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
1	1.0					
2		G-1	1.6'	NA	brown sand	
3	3.0					
4		G-2	1.2'	NA	brown silty SAND	
5	5.0					
6		G-3	1.2'	NA	brown SAND	
7	7.0					backfill boring

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
0F39.93.B0.03	P4	1	1

SOIL BORING LOG

PROJECT RMC EAST PARKING LOT LOCATION P4

ELEVATION _____ DRILLING CONTRACTOR GEO-TECH EXPLORATIONS

DRILLING METHOD AND EQUIPMENT GEO-Probe

WATER LEVELS _____ START 7/25/94 FINISH 7/25/94 LOGGER Lee

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
1	1.0					
2		G-1	1.4'	NA	SILTY SAND, Brown	
3	3.0					
4		G-2	1.0'	NA	Brown Silty SAND	
5	5.0					
6		G-3	1.9'	NA	Brown Silt	
7	7.0					backfill boring

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
0F39233.B6.03	P1	1	1

SOIL BORING LOG

PROJECT RMC East Parking Lot LOCATION P1

ELEVATION _____ DRILLING CONTRACTOR GEO-Tech Explorations

DRILLING METHOD AND EQUIPMENT Geo-Probe

WATER LEVELS _____ START 7/25/94 FINISH 7/25/94 LOGGER Lee

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
1	1.0					
2		G-1	1.0'	NA	brown silty SAND (.4"), brown sand (.6")	
3	3.0					
4		G-2	1.2'	NA	brown silty SAND	
5	5.0					
6		G-	1.8'	NA	brown silt	
7	7.0					backfilled boring

Capacitor Search

PROJECT NUMBER	TEST PIT NUMBER
OPE 39293.13	NE-CAP-SEARCH SHEET 1 OF 1

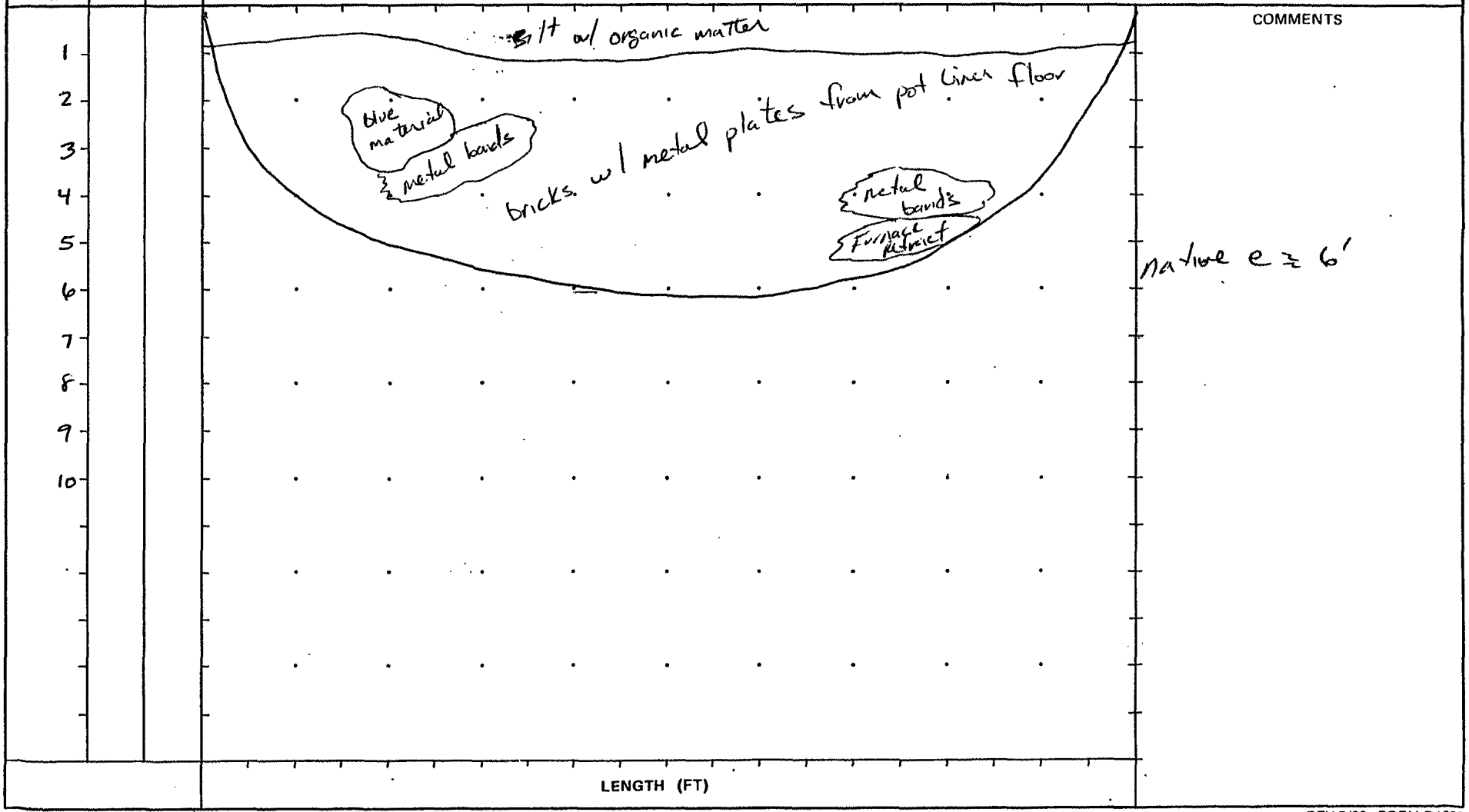
TEST PIT WALL LOG

PROJECT Reynolds Metals LOCATION Northeast Landfill MAP OF N WALL OF PIT

ELEVATION _____ CONTRACTOR Stratus Corp DATE EXCAVATED 9/13/94

WATER LEVEL AND DATE _____ EXCAVATION METHOD CAT 416B LOGGER Rwo

APPROXIMATE DIMENSIONS: LENGTH 15 WIDTH 5 DEPTH 6 REMARKS No Caps



REV 7/86 FORM D1599

Appendix C

Geo Recon Electrical Resistivity Survey Report

GEO RECON INTERNATIONAL

applied geophysics

December 15, 1994
J94-611

Dave Dailer
CH2M-Hill, Inc.
825 N.E. Multnomah, Suite 1300
Portland, Oregon 97232

Gentlemen:

This letter report presents the results of geophysical studies completed to assist with geo-hydrologic and environmental studies at the Reynolds Aluminum Plant near Troutdale, Oregon. The general location of the exploration sites are shown on Figure I, Vicinity Map.

Magnetic, Electromagnetic and Electrical resistivity methods are viable geophysical techniques to assist in the definition of the subsurface geologic conditions at the Reynolds site. The electromagnetic and electrical resistivity methods were used in the South landfill area. The electromagnetic and electrical resistivity data appears to indicate the spatial location of the suspected waste area. It is important to note that the VES data solution, although plotted as a point solution, is derived over a moderately large area, and as such represents a composite average of the geophysical properties of the material layering at that point; whereas a drill hole log describes a discrete sample at a discrete depth.

Test pits were subsequently excavated by CH2M-Hill at several locations to establish correlation's between the VES data and discrete samples.

The computer methodology used to reduce the field collected electrical resistivity data to solution layering is more rigorous than curve matching or other empirical techniques. We normally use these more rigorous procedures to reduce the number of possible solutions for any single set of field data and provide a more definitive description of the geophysical regime at exploration sites.

The exploration program was coordinated with Mr. Dave Dailer of CH2M-Hill, Inc. The field data were collected between August 16 and August 30, 1994. Coordinate locations were established by reference to grid lines previously established by CH2M-Hill surveyors. Vertical control was obtained from the topography, as shown on a provided map.

P.O. Box 55189 Seattle, Wa. 98155 USA (206) 362-9484

MAGNETIC METHOD

The purpose of the magnetometer survey was to locate potential areas where electrical capacitor cores may have been buried. The areas, which were investigated, had been previously identified by Reynolds Metals and CH2M-Hill reconnaissance activity. The sites were surveyed on lines arbitrarily established across each area after discussion with CH2M-Hill personnel.

A EDA OMNI IV Magnetic Gradiometer was used to make the magnetic readings over five selected areas. This instrument records the Total Field of the top sensor, time and date of each reading and the X-Y grid location of the reading. The Total Field reading of the top sensor has been reduced to an arbitrary base station reading of 57,000 nano-Tesla (nT) utilizing Tie-Line methods to correct for diurnal variations occurring during the measurement period. A separate base station was established for each of the 5 areas. The average magnetic field for the area was in the order of 57,000 nT. The instrument is controlled by micro-processors, and the programming includes a circuit check of the processing system when the instrument is turned on. A brief discussion of magnetic theory follows in the text below.

RESULTS

The data from the five sites are presented as magnetic profiles at each site. Site 1, the north landfill area consists of line 1 and line 2, Figures 3 and 4. Line 1 was completed East to West with station 100 equal to a survey hub placed by CH2M-Hill surveyors. The ending station of line 2 is at station 100 of line 1. The most significant feature of these two lines is the magnetic high occurring near station 75 of line 1. This may also be associated with the high shown near the end of line 2.

Line 3, Figure 5, was completed along an open area approximately 500 feet South of line 1, near the northeast corner of the company Lake. The line began at the outfall road to the island heading in a general westerly direction. No apparent anomalies are noted on this line, but proximity of power lines may have overridden any magnetic anomaly.

Line 4 and line 5, Figures 6 and 7, were completed along the top of the dike. High magnetic values observed along these lines are very likely the product of significant deposits of baked brick. Near the end of each line apparent major changes in the magnetic field are the product of power line interference.

Line 6 and line 7, Figures 8 and 9, were completed approximately 100 feet East of the power substation with approximately 50 feet separation between the lines. The lines were completed from the plant road to the dike (South to North). Again significant interference from overhead power lines was noted.

Lines 8 through 11, Figures 10, 11,12 and 13, were completed just northeast of the Reynolds facility, near the intersection of Sundial Road and the Plant Road. Line 8, Figure 10, was positioned approximately 50 west of the plant fence. All lines were North to South and spaced approximately 100 apart. The

data from lines 8 and 9 were relatively smooth and uneventful. Lines 10 and 11, Figures 12 and 13, show a significant negative to positive dipole effect approximately mid-line. It is suggested that further direct exploration be completed near the center of line 11.

MAGNETIC THEORY

The magnetic field over the surface of the earth is affected by local concentrations of (or absence of) magnetic materials, resulting in "anomalies" in the measured magnetic field. The concentrations or magnetic sources are described as either "dipoles" or "monopoles" depending on the configuration of the magnetic source. A "dipole" is essentially a magnetic source that exhibits both north and south poles, whereas a "monopole" exhibits a single pole, with the opposing pole at a great distance or infinity. An example of a "monopole" is that anomaly created by a deep well casing, whereas a "dipole" is that anomaly created by a piece of iron lying on the surface. However, it is noted that a magnetic source may be considered either as "line of monopoles" or as "line of dipoles" depending on the configuration of the source and the direction of the earth's field. For almost all cultural magnetic features, including hearths, the magnetic response is that of a dipole (Linington, 1964).

A material may have two magnetic fields; (1) an induced magnetization and (2) a remnant magnetization. Induced magnetization results from the ambient magnetic field, or the magnetic field of the earth. Remnant magnetization is that magnetic component which has a fixed direction relative to the rock and is independent of the earth's magnetic field.

The magnetic susceptibility (a measure of the degree to which a substance exhibits magnetization by an external field) increases when soil containing ferromagnetic material is heated and then cooled. That is, the magnetic susceptibility of the soil increases due to an increase in remnant magnetism (i.e. magnetism remaining in the absence of a magnetic field) as the temperature increases and is (or falls) below the Curie point (the Curie point of most rocks is 550 C.). The Curie point is the temperature above which thermal agitation prevents spontaneous magnetic ordering.

The strength of a "dipole" anomaly is inversely proportional to the cube of the distance between the source and the point of measurement. The magnetic strength of a "monopole" is inversely proportional to the square of the distance between the source and the point of measurement. The function describing a source magnetic strength is a function of the magnetic moment of the source, the distance from the source to the point of measurement, and a trigonometric relationship to the angle of inclination of the magnetic field. To define the fall off from the "peak" of the anomaly, the simple dipole function can become a complex equation.

ELECTROMAGNETIC METHODS

The electromagnetic data was collected with a Geonics EM-31. The data was collected by recording both the inphase and out-of-phase (quadrature) components, which were converted into apparent conductivity in milli-Siemens

per metre (milli-mhos per metre) for the conductivity and to parts per thousand (ppt) for the inphase response. The depth penetration of the EM-31 is approximately 18 to 19 feet (in the vertical dipole mode) depending on the height the instrument is carried off the ground, and the conductivity of the material measured.

The EM data points were collected at 25 foot intervals along the grid lines.

The EM-31 is a frequency domain electromagnetic device. The device transmits a 9.8 kHz electromagnetic signal. The resulting electromagnetic signal is received at another coil, spaced 3.66 metres from the transmitting coil. As the electromagnetic wave encounters a conducting medium (the ground), it sets up an alternating flow of current, which in turn radiates a wave at an equivalent frequency. This secondary wave interacts with the primary wave (transmitted through the air), creating distortion of the transmitted wave at the receiving coil. The amount of distortion is a function of the ability of the current to flow in the second medium (the ground), or the ground conductivity. The current flow through the ground is a function of two variables, (1) the inphase portion and (2) the out-of-phase portion. The out-of-phase portion acts at ninety degrees to the inphase portion.

When the transmitted wave interacts with a conductive material the distortion is dominated by the out-of-phase portion of the re-radiated wave. As a result the "computed" ground conductivity goes to zero (the inphase and out-of-phase voltages reverse polarity). The decrease in conductivity is preceded and followed by an increase in apparent conductivity.

The electromagnetic data was used as a guide along with the electrical resistivity data to determine the landfill boundary shown on Figure 2, Electrical Resistivity Studies. The electrical resistivity data was used as a guide for further direct exploration. Based upon our understanding of the local geology of the Reynolds site , we believe the near surface materials should exhibit a relatively high electrical resistivity, except in the materials below the water table where a reduction of the overall resistivity should occur. We believe the landfill materials should conversely demonstrate a low resistivity. Based upon the above, we have constructed an interpreted outline of the area believed to contain landfill materials. Variations, of the resistivity, within this area may represent changes in the percentage of landfill materials present. Of particular note are the very low resistivity zones shown near grid points E-500, D-400, C-150 and A-250. These areas show an extremely low resistivity which may indicate very high percentages of landfill materials. A general interpreted depth of the waste fill, based upon the electrical resistivity data, is approximately 6 to 8 feet. However, the highly variable nature of the fill material do not produce a uniform resistivity by which to establish a definite boundary.

The density of electrical data along line D is much more sparse than along other lines. Much of the data along this line was not interpretable due to interfering noise. The noise may be produced by unknown subsurface features, such as pipes and large deposits of metallic debris which produce huge lateral changes along the sounding array.

THE ELECTRICAL RESISTIVITY METHOD

The electrical resistivity method may be utilized to determine the configuration of subsurface materials based upon differences in their electrical properties (i.e., electrical resistivity).

C. and M. Schlumberger during the early 1900's were the primary developers of electrical prospecting methods, as we know them today. Utilizing resistivity mapping and electrical soundings they revolutionized the field of geophysical exploration. Initially, electrical methods were applied to Tectonic mining surveys of sedimentary deposits, each formation being characterized by its resistivity. Since the position and material properties of the strata, together with the amount of water contained in the strata. affects the electrical properties of the strata, it rapidly became evident that formations could be followed, their thickness determined and permeable areas located. Analogous to the location of permeable areas, Barnes in the 1950's proposed the use of electrical methods for the delineation of sand and gravel deposits. The basis for this proposal was the significant increase in resistivity to be expected by the increase in the granular nature of underlying deposits. These increases in resistivity would thus equate permeability and granularity.

In 1974 the U.S. Geological Survey published a text entitled, "The Application of Surface Geophysics to Groundwater Investigations". This text was instrumental in establishing a basis for the use of electrical resistivity methods in groundwater exploration. The field of electrical techniques has rapidly progressed in recent years by notable advances in field instrumentation and interpretive methods.

Advances in instrumentation has lead to the development of solid state circuitry for power supplies and signal amplification in the receiver. These advances have resulted in lower weight for power capabilities and greater sensitivity. The primary result of increased sensitivity is that the sensitivity may only be limited by internal instrumentation electrical noise. Electrical noise originating from industrial currents or natural earth currents have been significantly reduced by the use of synchronous detection systems, in which the transmitter current and receiver polarity are reversed periodically at a frequency of less than one Hertz. Noise which is asynchronous with the switching frequency is then averaged out.

Theoretical Background

The resistivity of a geologic unit is a function which is determined by the amount of contained water; the quantity of total dissolved salts in the water and the distribution of the water within the unit, that is the amount of void space which may contain water. Thus, the resistivity of most granular soils and rocks is controlled more by porosity, water content and water quality than by the conductivity of matrix materials.

The capacity of a strata to conduct electricity is affected by the number of interconnected spaces (permeability) and the water content. Void spaces must be interconnected and filled with water in order to conduct electricity. The pore volumes may consist of two parts; larger voids which serve as storage locations and finer interconnecting zones. Much of the resistance to current flow is due to the connecting of small sized pores because of their smaller cross section. Thus, a rock with a higher ratio of storage pore volume to connecting pore volume will have a higher resistivity.

Clay minerals such as kaolinite, halloysite, montmorillonite, etc., have the property of absorbing ions in an exchangeable state. Thus, when clay is mixed with water, the exchangeable ions may separate from the clay minerals in a process resembling ionization. These ions render the water in a pore structure conductive, even when the water has no salinity. Most earth materials possess some exchange capacity, therefore, the conductivity of an electrolyte in a pore structure will always be increased by ions supplied by desorption.

The pore structure of a geologic material need not necessarily be filled with an electrolyte as is usually found in strata lying above the regional groundwater table. Most of the pore space is generally filled with air with only the granular surfaces coated with water, termed pellicular water. The resistivity of a material containing only a partial fraction of saturation will generally exhibit a resistivity much higher than the same material fully saturated. Studies of the effect desaturation has on the resistivity of various types of oil reservoir rocks containing saline water have led to recognition of an empirical expression termed Archie's Law:

$$\rho_a = \rho_w \psi^{-m}$$

where ρ_a is the bulk resistivity of the geologic unit, ρ_w is the resistivity of the water contained in the pore structure, and ψ is the porosity expressed as a fraction per unit volume of rock. The terms "a" and "m" are parameters whose values are assigned to allow the equation to fit practical field measurements.

Generally it has been found that "a" is slightly greater than one, and "m" is slightly less than two for granular materials. Thus, as the above equation indicates, the resistivity increases as (approximately) the square of the reduction in water content. It therefore is suggestive that resistivity measurements should be an effective method to determine the degree of saturation and porosity (i.e., grain size distribution).

Field and Interpretive Methods

Vertical electrical soundings (VES) are accomplished by applying a direct current or very low frequency synchronous alternating current to the ground through a pair of electrodes (A & B) and measuring the resulting potential established by this current across a second set of electrodes (M & N). The corresponding resistivity may be calculated according to Ohm's Law as follows:

$$R = K(E/I)$$

Where K is a geometric factor depending only upon the relative position of the four electrodes.

In order to study the variation of resistivity with depth, the spacing between the various electrodes is gradually increased. The effect of materials at depth becomes more pronounce with the increased electrode spacing and corresponding set of potential measurements. The relationship of electrode spacing to potential distribution is shown in Figure 2R for a uniform homogenous half space.

Interpretation of the corresponding data obtained during an electrical resistivity study has evolved tremendously since the work of the Schlumberger brothers in the 1900's. This evolution has followed a sequence consisting of solution by empirical techniques (circa 1940-1960 to present). The empirical methods involved the assumption of a direct relationship of depth to electrode spacing and in many instances, appeared to produce reasonable results, when the underlying substratum was non-conductive. Curve matching techniques achieved much better results but were however rather limited by the number of published theoretical curves and the complexity of the field curve. Generally, the analysis of a field curve was limited to no more than four layers. There were additional techniques by which a curve could be matched to allow five or more layers, although due to the tedium and inaccuracies introduced by these solutions, such solutions were utilized very infrequently with less than desirable results. During the early to mid-1970's, several investigators began to use high speed digital computers for the analysis of electrical resistivity data. Probably the most predominant interpretive method which has evolved consists of the convolution of the field curve by the application of a series of filter coefficients which are applied for the direct solution of the integral defining the resistivity of a solid earth. Thus, it is possible to develop an electrical model from the field curve with no further input. Currently, it is possible by utilization of computer techniques to easily solve field curves in excess of five layer electrical models.

Dependent upon site conditions and the electrical "target", we may use one or more electrode arrays. In these arrays the current is applied across the outer electrodes. The potential change is measured between two inner electrodes.

ELECTRICAL RESISTIVITY DATA

The interpreted thickness, depths and resistivity values for each sounding are computed as (1) the Dar Zarrouk Reduction of the Detailed Solution and (2) the Detailed Solution to Smoothed VES Curve. The Detailed Solution is the interpreted resistivity solution for an initial estimation of 1 layer per data point. After the initial program pass, this estimation is reduced in the Dar Zarrouk domain, and the remaining layers are resolved until the curve fitting criteria is satisfied. The input data is projected to the preceding decade (in this case 0.1 to 1 metre, AB/2) to resolve the top most layers. The reduced

data is based upon the Dar Zarrouk reduction of the detailed solution. The Dar Zarrouk reduction is generally that which we select for the final interpretation. It is noted, however, that the Dar Zarrouk reduction may eliminate some thin layers that may be significant. Both solutions should be inspected to determine layer continuity between adjacent soundings.

ELECTRICAL RESISTIVITY METHODS AND INTERPRETATION

1. EQUIPMENT

A. An AGI Sting R1 electrical resistivity system was used for this study with associated interconnect cables and stainless steel electrodes.

2. ELECTRICAL RESISTIVITY FIELD METHODS

The vertical electrical soundings (VES) were accomplished by applying a D. C. current to the ground through a pair of electrodes and measuring the potential established by this current across a second set of electrodes. In order to study the variation of resistivity with depth, the spacing between the various electrodes was gradually increased. The effect of materials at depth becomes more pronounced with the increased electrode spacing and corresponding potential.

We trust the above will complete your requirements for this project. If you need further clarification or additional information please let us know.

For: Geo Recon International Ltd.

Clyde A. Ringstad
Principal Geophysicist

Line 11

CH2M-HILL

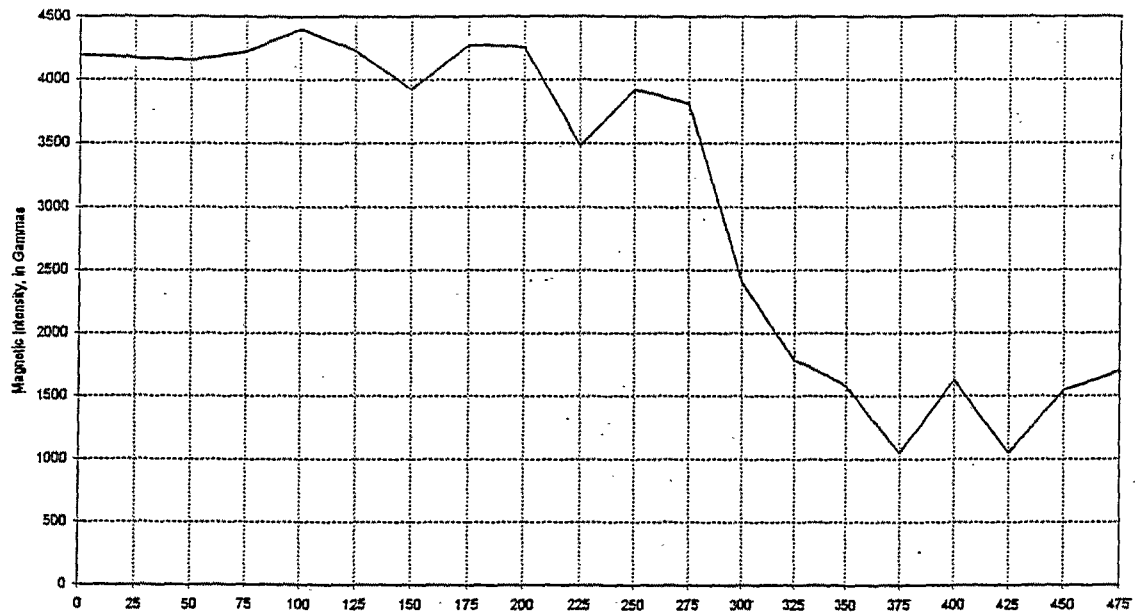
REYNOLDS ALUMINUM PROJECT
TROUTDALE — OREGON

MAGNETOMETER SURVEY

SEPTEMBER 1984 J84-611

GEO-RECON INTERNATIONAL LTD. FIG. 13

Line 10



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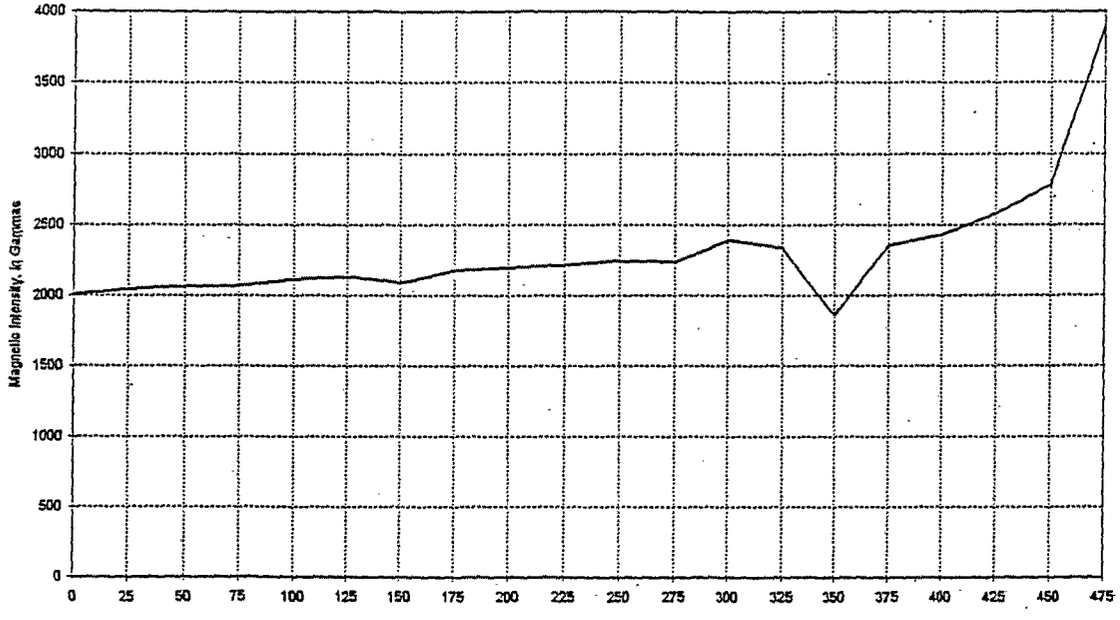
REYNOLDS ALUMINUM PROJECT
TROUTDALE — OREGON

MAGNETOMETER SURVEY

SEPTEMBER 1994 J94-611

GEO-RECON INTERNATIONAL LTD. FIG. 12

Line 9



CH2M-HILL

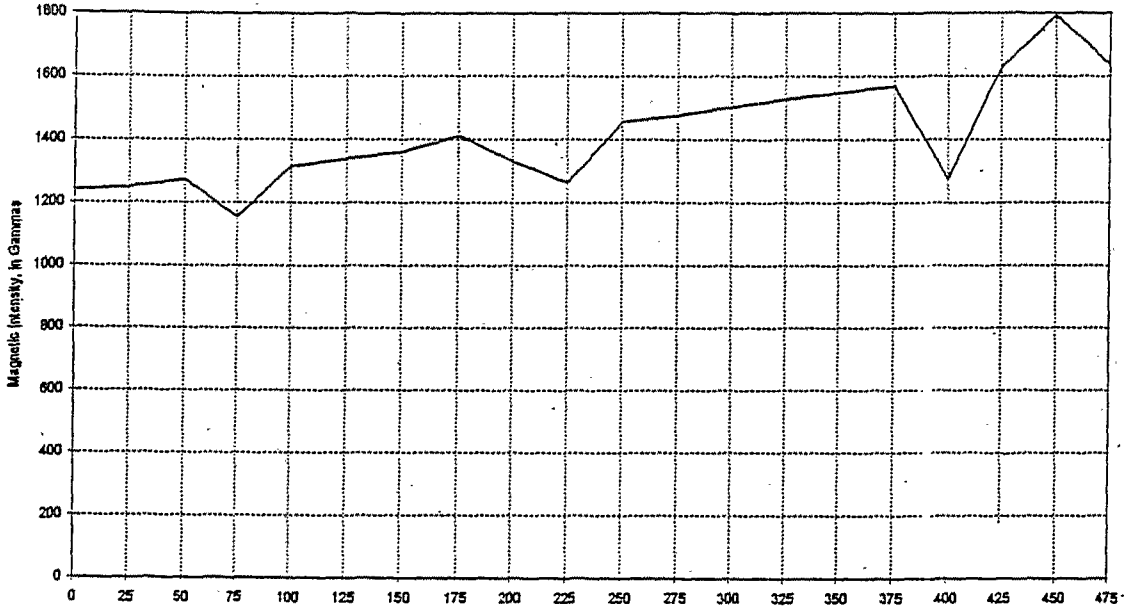
REYNOLDS ALUMINUM PROJECT
TROUTDALE — OREGON

MAGNETOMETER SURVEY

SEPTEMBER 1984 J84-611

GEO-RECON INTERNATIONAL LTD. FIG. 11

Line 8



CH2M-HILL

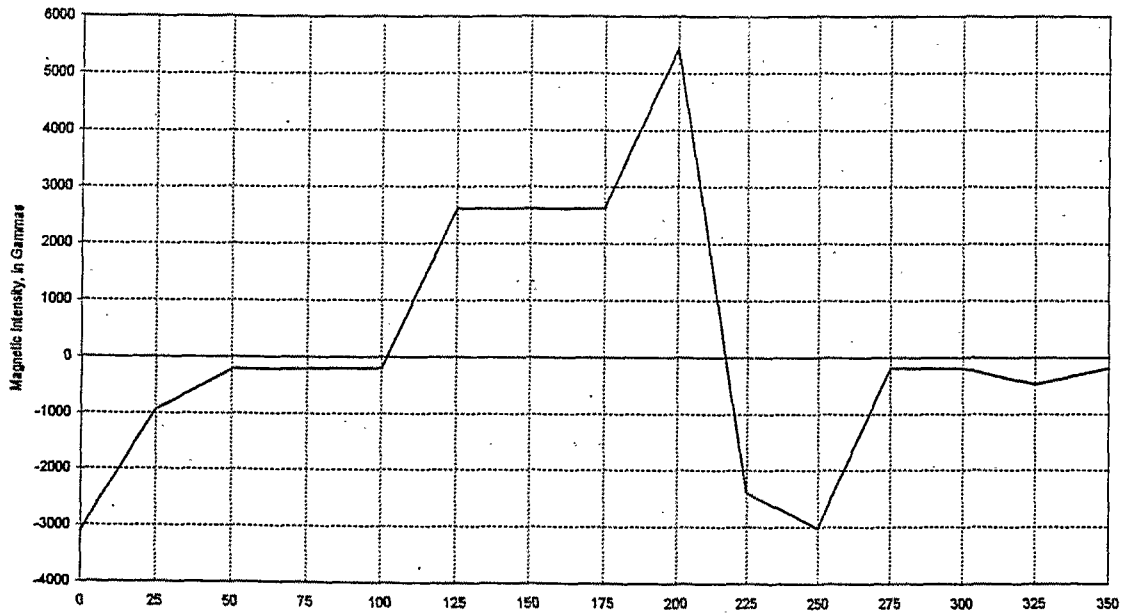
REYNOLDS ALUMINUM PROJECT
TROUTDALE — OREGON

MAGNETOMETER SURVEY

SEPTEMBER 1984 J84-611

GEO-RECON INTERNATIONAL LTD. FIG. 10

Line 7



CH2M-HILL

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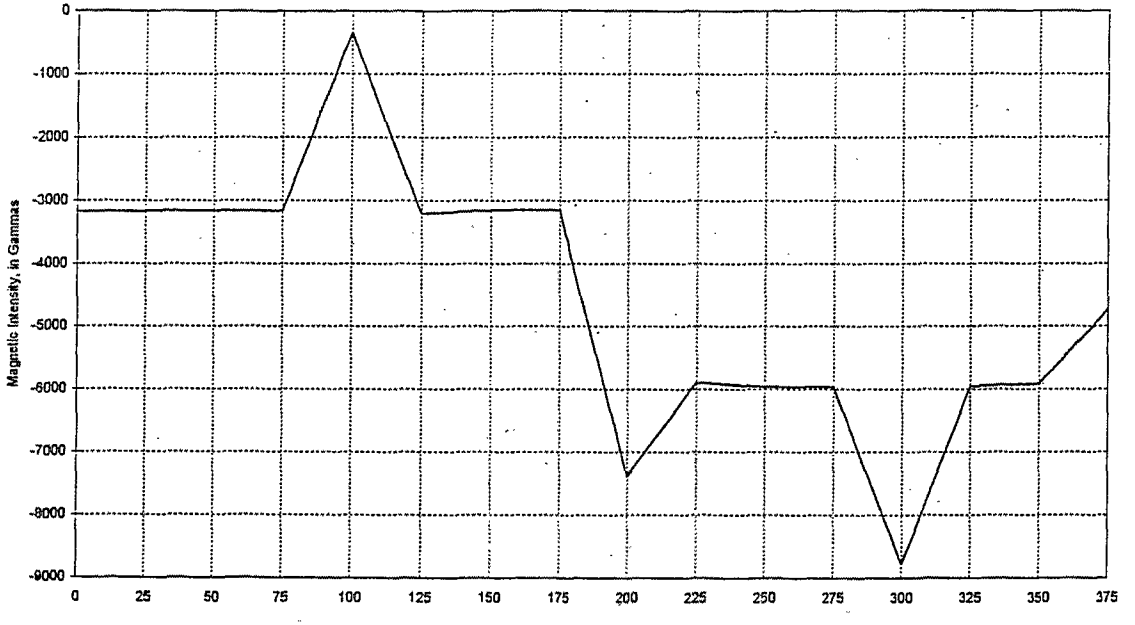
TROUTDALE — OREGON

MAGNETOMETER SURVEY

SEPTEMBER 1994 J94-611

GEO-RECON INTERNATIONAL LTD. FIG. 9

Line 6



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TROUTDALE – OREGON

MAGNETOMETER SURVEY

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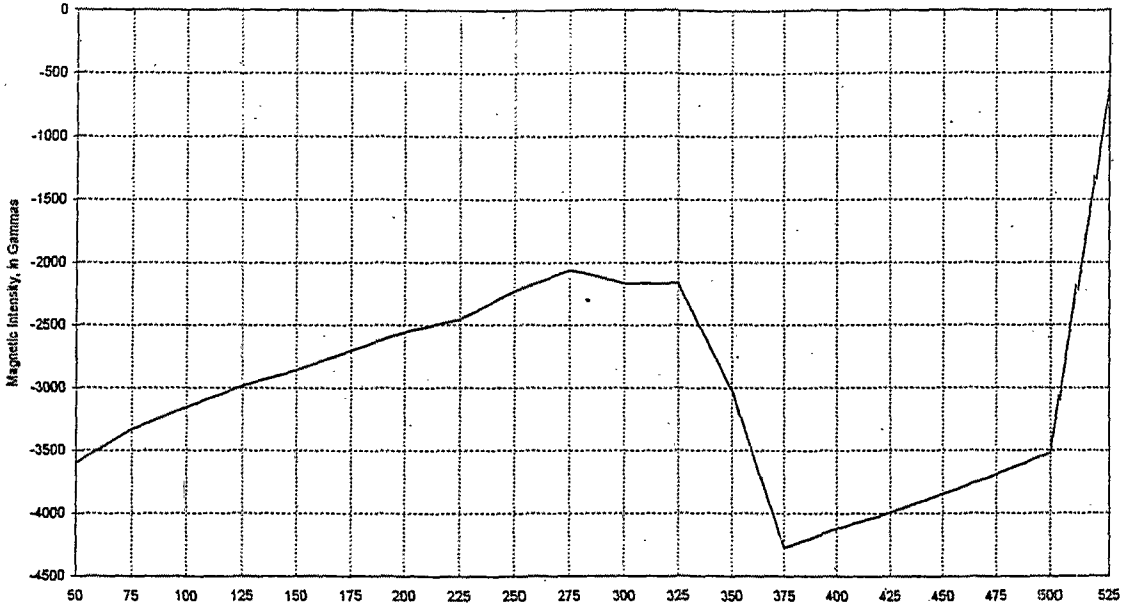
GEO-RECON INTERNATIONAL LTD. FIG. 8

Line 5



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MAGNETOMETER SURVEY

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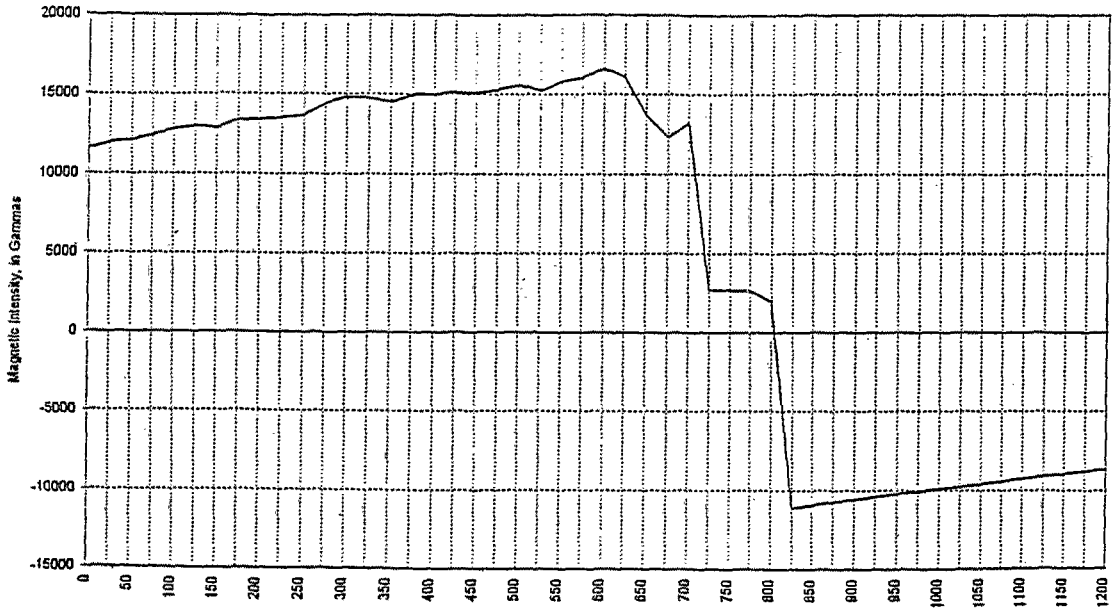
GEO-RECON INTERNATIONAL LTD. FIG. 7

Line 4



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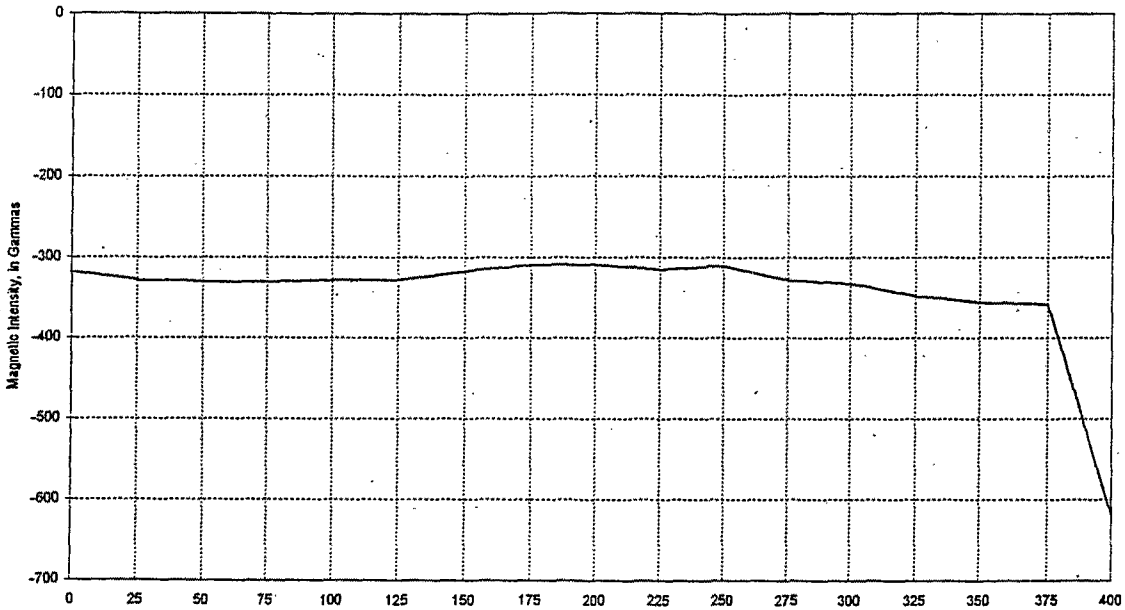
GEO-RECON INTERNATIONAL LTD. FIG. 6

Line 3



CH2M-HILL

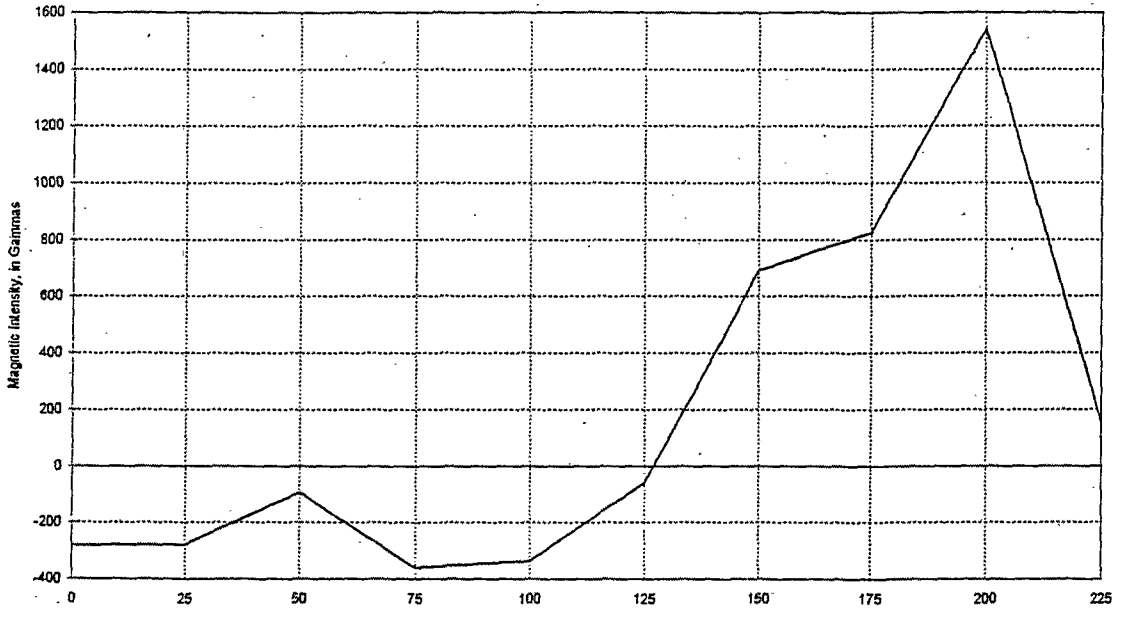
REYNOLDS ALUMINUM PROJECT
TROUTDALE – OREGON

MAGNETOMETER SURVEY

SEPTEMBER 1994 J94-811

GEO-RECON INTERNATIONAL LTD. FIG. 5

Line 2



CH2M-HILL

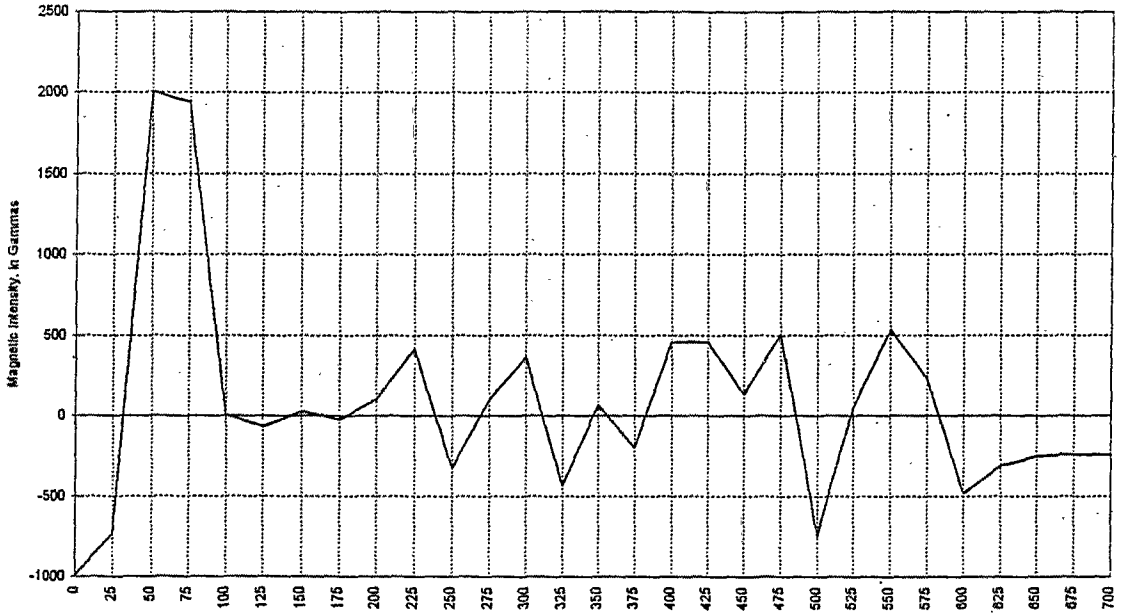
REYNOLDS ALUMINUM PROJECT
TROUTDALE - OREGON

MAGNETOMETER SURVEY

SEPTEMBER 1994 J94-611

GEO-RECON INTERNATIONAL LTD. FIG. 4

Line 1



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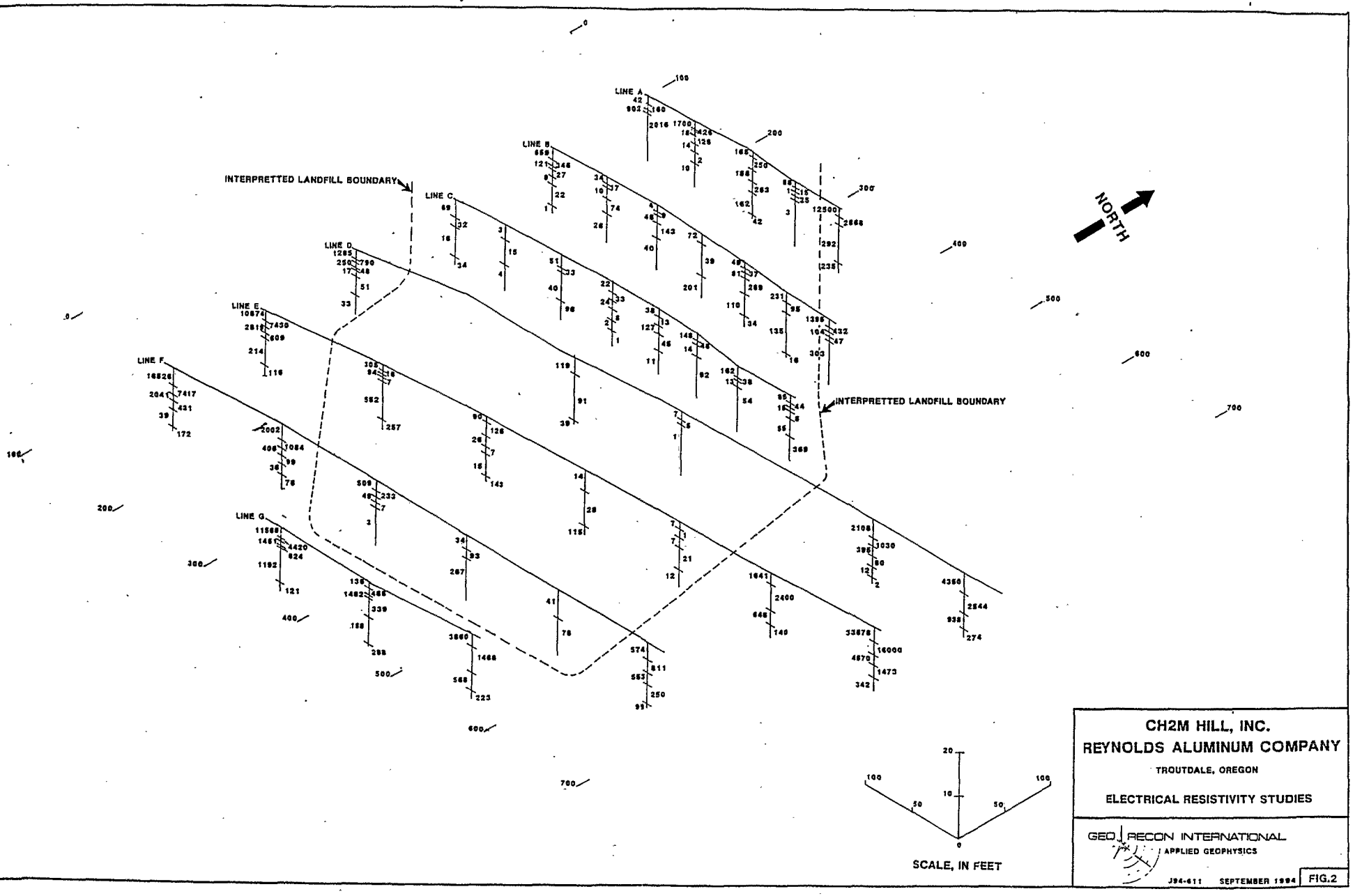
MAGNETOMETER SURVEY

SEPTEMBER 1994 J94-611.

GEO-RECON INTERNATIONAL LTD. FIG. 3



CH2M HILL, INC.

REYNOLDS ALUMINUM COMPANY

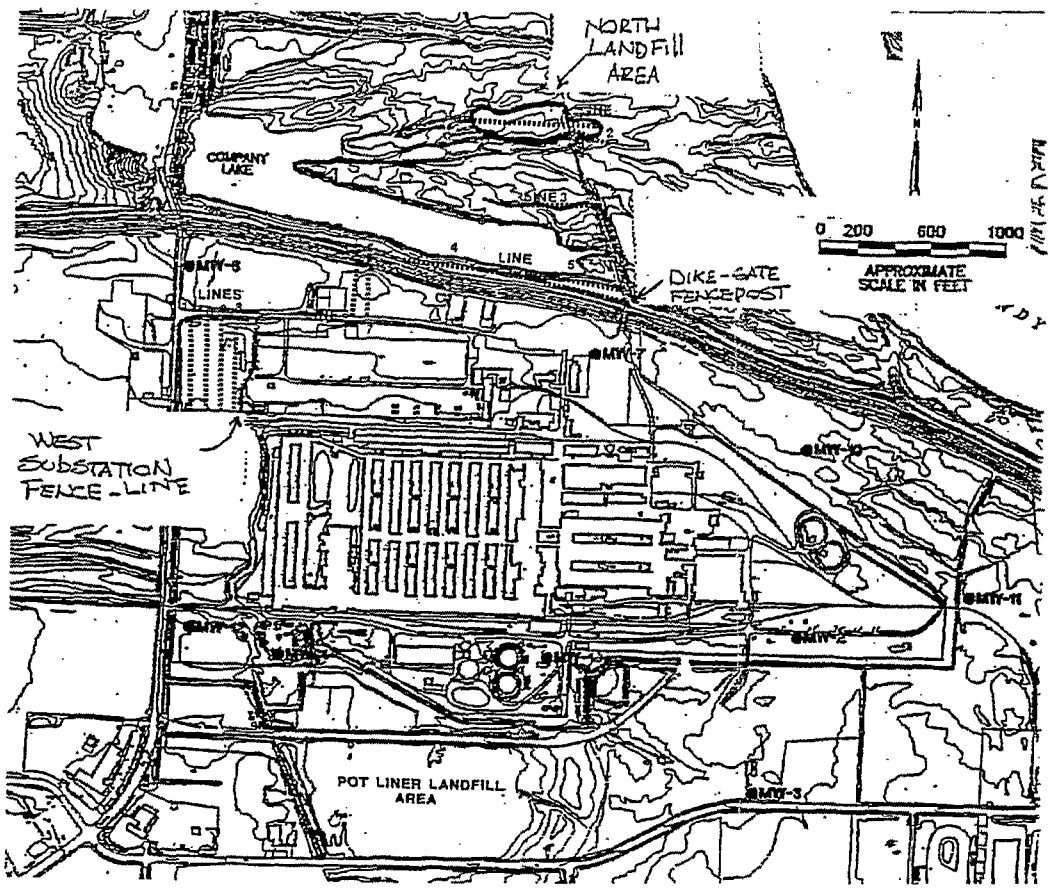
TROUTDALE, OREGON

ELECTRICAL RESISTIVITY STUDIES

GEO RECON INTERNATIONAL

APPLIED GEOPHYSICS

J94-611 SEPTEMBER 1994 FIG.2



CH2M-HILL INC.

REYNOLDS ALUMINUM COMPANY
TROUTDALE - OREGON

LOCATION PLAN MAP

SEPTEMBER 1984 J94-611

GEO-RECON INTERNATIONAL LTD. FIG.1

Appendix D

Monitoring Well Geologic Logs and Well Construction Diagrams

PROJECT NUMBER	WELL NUMBER	
OPE39293.B1.01	MW-01	SHEET 1 OF 1

MONITORING WELL GEOLOGIC AND CONSTRUCTION LOG

PROJECT Reynolds Metals LOCATION Old Cryolite Plant

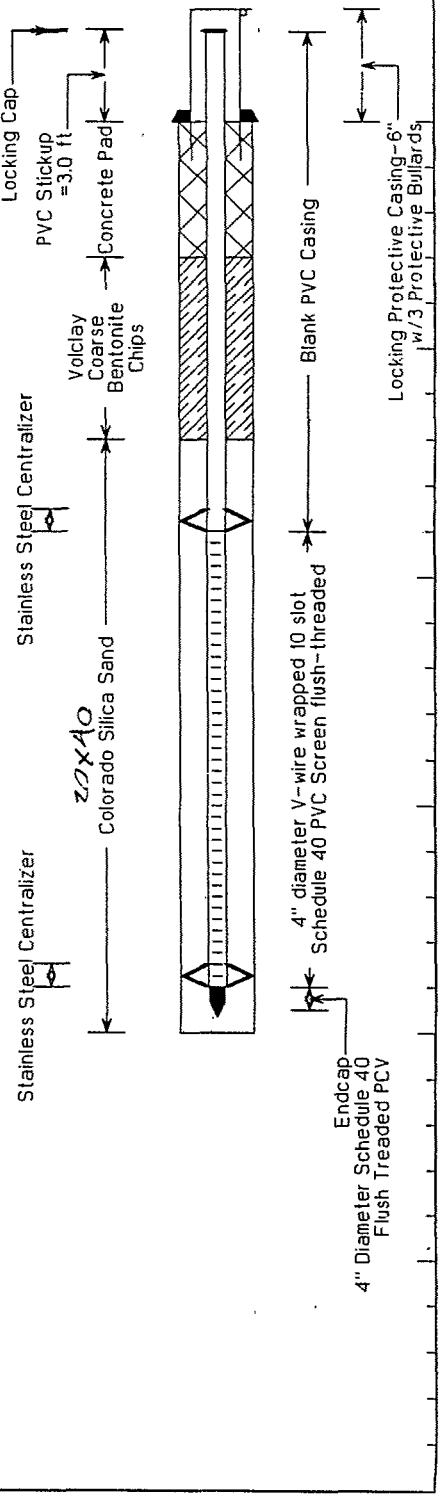
MEASURING POINT ELEV (NGVD) 28.25 DRILLING CONTRACTOR GeoTech-Mickey

DRILLING METHOD AND EQUIPMENT HSA 8-1/4" Augers, Canterra 250

WATER LEVEL ELEV/DATE 10.56 7-18-94 START 7-12-94 FINISH 7-12-94 LOGGER Heidi Hoffmann

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY FEET	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	USCS DESCRIPTION
	2.5				SILTY SANDY GRAVEL, GM, brown, angular gravel, dry, fill.	GM/FILL
	4.0	S-1	1.5	12-13-20 (33)	SILT, ML, v. dk gray, (10YR 3/1), dry, hard, wood pieces, OVM=0.0, HCN=0.0.	ML
5.0	5.0					
	6.5	S-2	1.5	10-22-23 (45)	SAND, SP, dk grayish brown, (10YR 4/2), moist, medium sand, 5% silt, dense, Fe-oxide staining. OVM=0.0, HCN=0.0.	SP
	7.5					
	9.0	S-3	1.5	8-20-23 (43)	SAND, SP, dk grayish brown, (10YR 4/2), coarse sand, 5-10% silt, dense, moist-wet. OVM=0.0, HCN=0.0.	
10.0	10.0					
	11.5	S-4	0.6	7-8-6 (14)	SAND, SP, dk grayish brown, (10YR 4/2), wet, coarse sand, 5% silt. At 11.2': SILT, ML, grayish brown, wet, stiff. OVM=0.0, HCN=0.0.	
	12.5					
	14.0	S-5	1.0	2-3-1 (4)	SILT, ML, v. dk gray, (2.5YN 3), wet, soft, plastic. OVM=0.0, HCN=0.0.	ML
15.0	15.0					
	16.5	S-6	0.8	2-2-3 (5)	SILT, ML, v. dk gray, (2.5YN 3), wet, firm, plastic. OVM=0.0, HCN=0.0. Drillers smell NH3 downhole.	
	17.5					
	19.0	S-7	0.6	3-4-3 (7)	SILT, ML, v. dk gray, wet, plastic, firm, lense of brown plastic, silt, 3" thick. OVM=0.0, HCN=0.0.	
20.0	20.0					
	21.5	S-8	1.3	2-3-5 (8)	SILT, ML, black, (5Y 2.5/1), wet, firm, plastic. OVM=0.0, HCN=0.0.	
25.0					BOH=20'	

WELL COMPLETION DIAGRAM



CH2M HILL

PROJECT NUMBER	WELL NUMBER
OPE39293.B1.01	MW-02 SHEET 1 OF 1

MONITORING WELL GEOLOGIC AND CONSTRUCTION LOG

PROJECT Reynolds Metals LOCATION Between Scrap Area & Former Mercury Spill

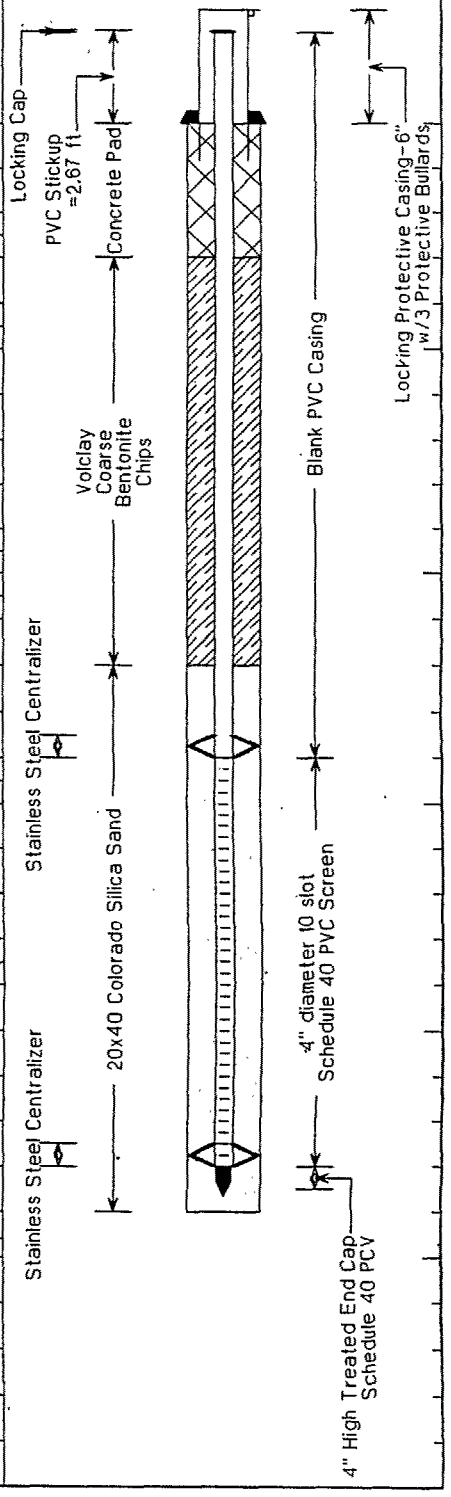
MEASURING POINT ELEV (NGVD) 31.65 DRILLING CONTRACTOR GeoTech-Mickey

DRILLING METHOD AND EQUIPMENT HSA 8-1/4" Augers, Canterra 250

WATER LEVEL ELEV/DATE 21.0 7-18-94 START 7-11-94 FINISH 7-11-94 LOGGER Heidi Hoffmann

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY FEET	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	USCS DESCRIPTION
	2.5				SILT, ML, v. dk gray, (7.5YRN 3/1), dry.	ML
	4.0	S-1	1.5	3-8-17 (25)	SILTY SAND, SM, brown, (10YR 4/3), dry, slightly moist at top of fine sand, medium. OVM=0.0, HCN=0.0.	SM
5.0	5.0					
	6.5	S-2	0.8		SAND, SP, brown, (10YR 4/3), v. sl. moist, fine sand, well-sorted. OVM=0.0, HCN=0.0.	SP
	7.5					
	9.0	S-3	1.5	7-9-10 (19)	SAND, SP, brown, wet, medium, fine sand. At 8":SILTY SAND, SM, brown, wet. OVM=1.0, HCN=0.0.	SM
10.0	10.0					
	11.5	S-4	1.5	1-2-3 (5)	SILT, ML, grayish brown, wet, soft. At 10.5":CLAY, CL, v. dk (7.5YRN 3/1), wet, plastic, firm, Fe-oxide staining. OVM=0.5, HCN=0.0.	ML / CL
	12.5					
	14.0	S-5	1.5	3-3-4 (7)	SILTY CLAY, CL, v.dk gray, Fe-oxide staining, wet, firm. SILTY SAND, SM, brown w/gray mottled, wet. OVM=0.0, HCN=0.0.	CL / SM
15.0	15.0					
	16.5	S-6	1.5	3-4-6 (10)	SANDY SILT, ML, dk gray, wet, loose, fine sand, 20-30% sand, Fe-oxide staining. OVM=0.0, HCN=0.0.	ML
	17.5					
	19.0	S-7	1.5	3-3-4 (7)	SAND, SP, gray, (7.5YR 4/N3), fine sand. Middle 6",SILTY SAND, SM, wet, loose. OVM=0.0, HCN=0.0.	SP / SM / SP
20.0	20.0					
	21.5	S-8	1.5	4-4-5 (9)	SILT SAND, SM, dk gray, (7.5YR 4/N3), wet, lenses of fine sand, loose. OVM=0.0, HCN=0.0.	SM
	22.5					
	24.0	S-9	1.5	4-4-6 (10)	SILTY SAND, SM, dk gray, (5YR 4/1), wet, loose, Fe-oxide. Bottom 6":SAND, SP, dk gray, wet, medium sand, well-sorted. OVM=0.0, HCN=0.0.	SM / SP
25.0					BOH-24'	

WELL COMPLETION DIAGRAM



PROJECT NUMBER	WELL NUMBER
OPE39293.B1.01	MW-03 SHEET 1 OF 1

MONITORING WELL GEOLOGIC AND CONSTRUCTION LOG

PROJECT Reynolds Metals LOCATION Graham Road

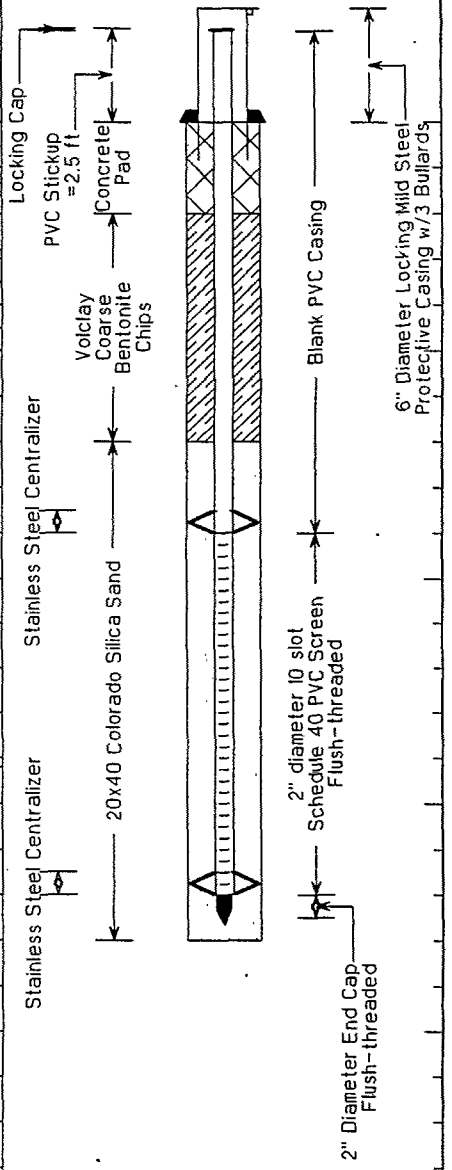
MEASURING POINT ELEV (NGVD) 29.69 DRILLING CONTRACTOR GeoTech-Mickey

DRILLING METHOD AND EQUIPMENT HSA 6 1/4" Augers Canterra 250

WATER LEVEL ELEV/DATE 7.19 START 7-9-94 FINISH 7-9-94 LOGGER Heidi Hoffmann

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY FEET	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION	USCS DESCRIPTION
	2.5				SILTY, ML, dk brown, dry.	ML
	4.0	S-1	0.6	17-18-16 (34)	SAND, SP, strong brown, (7.5YR 4/6), wet, fine, dense. At 3.5': SILT, ML, v. dk gray, (10YR 3/1), wet. OVM=0.0, HCN=0.0.	SP
	5.0					ML
5.0	6.5	S-2	1.5	8-9-17 (26)	SAND, SP, v. dk gray, (10YR 3/1), wet, medium, fining downward from medium to fine sand. OVM=0.0, HCN=0.0.	
	7.5					
	9.0	S-3	1.5	6-8-12 (20)	SAND, SP, v. dk gray, (10YR 3/1), wet, medium, fine sand, ~10% silt, Fe-oxide in top of spoon. OVM=0.0, HCN=0.0.	SP
	10.0					
10.0	11.5	S-4	1.5	7-12-14 (26)	SAND, SP, v. dk gray, (10YR 3/1), wet, medium v. fine sand, well-sorted. OVM=0.0, HCN=0.0.	
	12.5				SAND, SP, v. dk grayish brown, (10YR 3/2), wet, medium, v. fine sand, well-sorted. OVM=0.0, HCN=0.0.	
	14.0	S-5	1.5	6-12-6 (18)		
	15.0					
15.0	16.5	S-6	0.6	1-2-3 (5)	SILTY SAND, SM, dk grayish brown, (10YR 3/2), wet, loose, wood chunks. OVM=0.0, HCN=0.0.	SM
	17.5					
	19.0	S-7	1.5	1-3-2 (5)	SILTY SAND, SM, v.dk grayish brown, (10YR 3/2), wet, loose. OVM=0.0, HCN=0.0.	
20.0					BOH=18'	
25.0						

WELL COMPLETION DIAGRAM



CH2M HILL

PROJECT NUMBER	WELL NUMBER
OPE39293.B1.01	MW-04 SHEET 1 OF 1

MONITORING WELL GEOLOGIC AND CONSTRUCTION LOG

PROJECT Reynolds Metals LOCATION Near drainage ditch SW portion of site

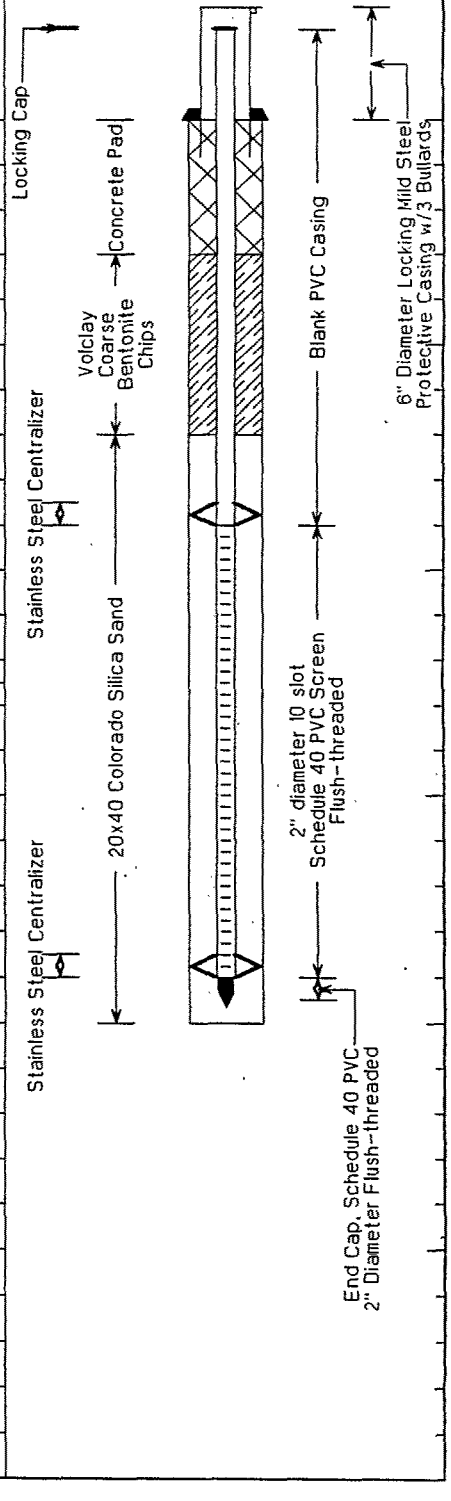
MEASURING POINT ELEV (NGVD) 26.91 DRILLING CONTRACTOR GeoTech-Stan

DRILLING METHOD AND EQUIPMENT HSA 8 1/4" Augers Conterra 250

WATER LEVEL ELEV/DATE 16.45 7-15-94 START 7-12-94 FINISH 7-12-94 LOGGER Heidi Hoffmann

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY FEET	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	USCS DESCRIPTION
	2.5					
	4.0	S-1	1.2	7-7-10 (17)	SILT, ML, grayish brown, (10YR 5/2), dry, black carbon staining plus black carbon pieces, stiff. OVM=0.0, HCN=0.0.	
	5.0					
5.0	6.5	S-2	1.5	5-6-7 (13)	SILT, ML, grayish brown, (10YR 5/2), sl. moist, black carbon staining, stiff, Fe-oxide. OVM=0.0, HCN=0.0.	ML
	7.5					
	9.0	S-3	1.5	4-5-6 (11)	SILT, ML, black, moist, stiff, abundent roots and wood, appears to be a recent surface. OVM=0.0, HCN=0.0.	
	10.0					
10.0	11.5	S-4	1.2	7-13-14 (27)	SILT, ML, dk gray, (10YR 4/1), wet, v. stiff, well-graded. OVM=0.0, HCN=0.0.	
	12.5					
	14.0	S-5	0	5/1.5'	No recovery.	
	15.0					
15.0	16.5	S-6	1.5	7-8-7 (15)	CLAY, CL, v. dk gray, wet, stiff, plastic. OVM=0.0, HCN=0.0	CL
	17.5					
	19.0	S-7	1.5	5-6-7 (13)	CLAY, CL, v. dk gray, (10YR 4/1), wet, stiff, plastic. OVM=0.0, HCN=0.0.	
	20.0					
20.0	21.5	S-8	1.5	5-6-9 (15)	CLAY, CL, v. dk gray, (10YR 4/1), wet, stiff, plastic, siltier at bottom.	
					BOH=20'	
25.0						

WELL COMPLETION DIAGRAM



PROJECT NUMBER	WELL NUMBER
OPE39293.B1.01	MW-05 SHEET 1 OF 1

MONITORING WELL GEOLOGIC AND CONSTRUCTION LOG

PROJECT Reynolds Metals LOCATION Near Sandy River

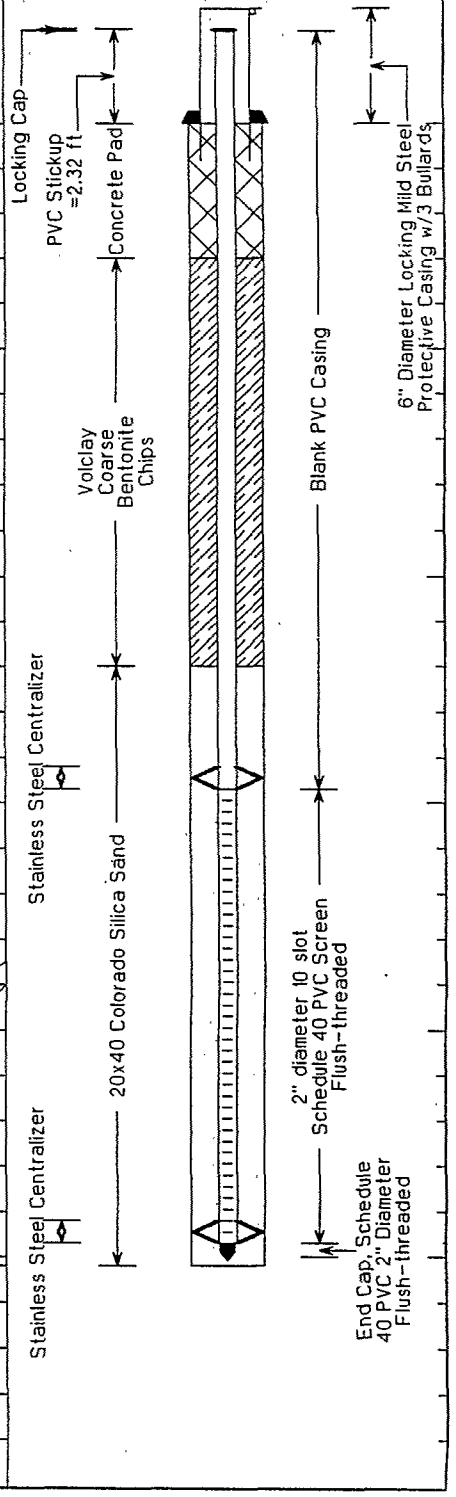
MEASURING POINT ELEV (NGVD) 33.99 DRILLING CONTRACTOR GeoTech-Mickey

DRILLING METHOD AND EQUIPMENT HSA 6 1/4" Augers Canterra 250

WATER LEVEL ELEV/DATE 12.65 7-18-94 START 7-8-94 FINISH 7-8-94 LOGGER Heidi Hoffmann

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY - FEET	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION	USCS DESCRIPTION
	2.5					
	4.0	S-1	1.5	7-8-14 (22)	SAND, SP, dk grayish brown, (10YR 4/2), dry, medium, medium- coarse, sandy, loose. OVM=0.0, HCN=0.0.	SP
5.0	5.0					
	6.5	S-2	1.5	7-10-9 (19)	SAND, SP, dk grayish brown, (10YR 4/2), v. sl. moist, loose. OVM=0.0, HCN=0.0. At 6': SILT, ML, gray and Fe-stained, mottled, v. moist.	
	7.5					
	9.0	S-3	1.5	5-6-5 (11)	SILT, ML, gray and Fe-oxided staining, mottled, v. moist to wet, plastic, stiff. OVM=0.0, HCN=0.0.	
10.0	10.0					
	11.5	S-4	1.5	3-9-3 (12)	SILTY CLAY, ML/CL, dk brown w/gray and Fe-oxide staining, mottled, plastic, wet, stiff. OVM=0.0, HCN=0.0.	
	12.5					ML
	14.0	S-5	1.5	2-1-2 (3)	SILT, ML, dk grayish brown, wet, soft, Fe-oxide and gray mottled vertical streaks. OVM=0.0, HCN=0.0.	
15.0	15.0					
	16.5	S-6	1.5	3-4-7 (11)	SILT, ML, dk grayish brown, wet, stiff, 10-20% fine sand, less Fe-oxide. OVM=0.0, HCN=0.0.	
	17.5					
	19.0	S-7	1.5	7-2-8 (10)	SILT, ML, dk grayish brown, wet, stiff, plastic, stringers of SILTY SAND, SM, fine-medium sand.	SM / ML
20.0	20.0					
	21.5	S-8	1.5	4-5-4 (9)	SANDY SILT, SM, dk grayish brown, orange, Fe-oxide and gray reduction staining, wet.	
	22.5					SM
	24.0	S-9	1.5	5-6-6 (12)	SILTY SAND, SM, dk grayish brown, wet, medium, fine-medium sand.	
25.0					BOH=25.2'	

WELL COMPLETION DIAGRAM



CH2M HILL

PROJECT NUMBER	WELL NUMBER
OPE39293.B1.01	MW-06 SHEET 1 OF 1

MONITORING WELL GEOLOGIC AND CONSTRUCTION LOG

PROJECT Reynolds Metals LOCATION Field on NE corner of Sundial & Reynolds Plants

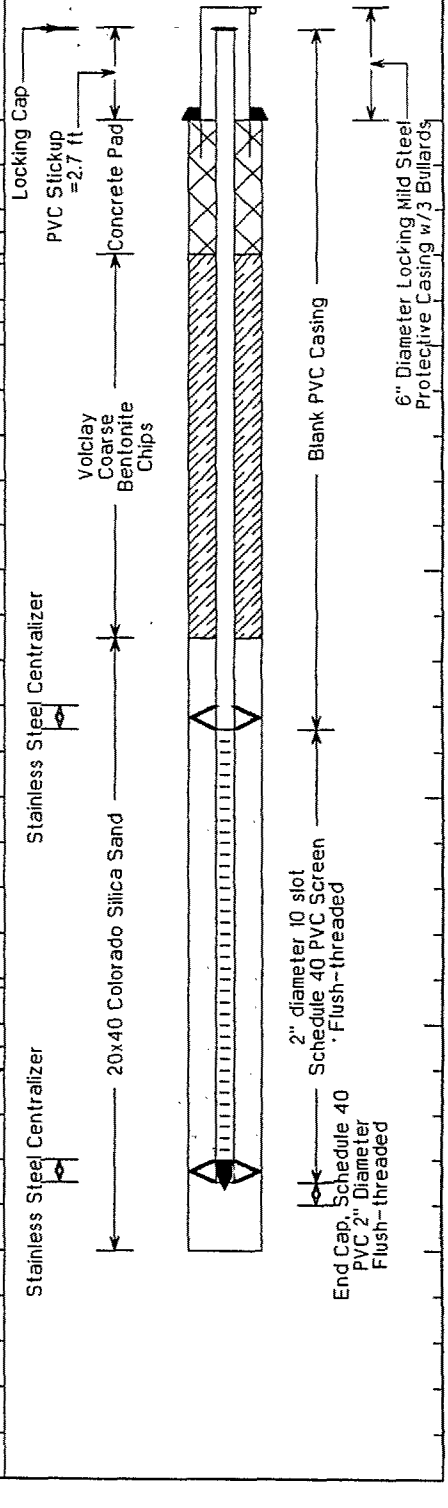
MEASURING POINT ELEV (NGVD) 26.81 DRILLING CONTRACTOR GeoTech-Mickey

DRILLING METHOD AND EQUIPMENT HSA 6 1/4" Augers Conterra 250

WATER LEVEL ELEV/DATE 11.79 7-13-94 START 7-8-94 FINISH 7-8-94 LOGGER Heidi Hoffmann

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY FEET	STANDARD PENETRATION TEST RESULTS 6" -6" -6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	USCS DESCRIPTION
	2.5					SP
	4.0	S-1	1.5	5-7-8 (15)	SAND, SP, dk grayish brown, (2.5Y 4/2), dry, medium, fine-medium sand, lenses of SILTY SAND, SM. OVM=0.0, HCN=0.0	SM
	5.0					SP
5.0	6.5	S-2	1.5	1-4-2 (6)	SILTY SAND, SM, dk brown, (10YR 3/3), wet. At 6": SILT, ML, dk grayish brown, (10YR 4/2), v. moist, Fe-oxide staining, stiff. OVM=0.0, HCN=0.0.	SM
	7.5					
	9.0	S-3	1.5	3-4-5 (9)	SILT, ML, dk grayish brown, (10YR 4/2), v. moist, Fe-staining, root casts, plastic, stiff. OVM=0.0, HCN=0.0.	
	10.0					
10.0	11.5	S-4	1.5	3-3-3 (6)	SILT, ML, dk grayish brown, wet, firm, 5-10% fine sand in stringers, Fe-oxide staining. OVM=0.0, HCN=0.0.	
	12.5					
	14.0	S-5	1.5	2-5-6 (1)	SILT, ML same as above.	ML
	15.0					
15.0	16.5	S-6	1.5	4-4-5 (9)	SILT, ML, same as above.	
	17.5					
	19.0	S-7	1.5	3-3-4 (7)	SILT, ML, same as above.	
	20.0					
20.0	21.5	S-8	1.5	4-4-9 (13)	SAND, SP, v. dk grayish brown, (2.5YR 3/2), wet, medium sand.	SP
	22.5				SILTY SAND, SM, center of spoon.	SM
	24.0	S-9	1.5	2-3-3 (6)	SAND, SP, v. dk grayish brown, (2.5YR 3/2), wet, medium sand, loose, 10-15% silt.	SP
25.0					BOH=25'	

WELL COMPLETION DIAGRAM



PROJECT NUMBER	WELL NUMBER
OPE39293.B1.01	MW-07 SHEET 1 OF 1

MONITORING WELL GEOLOGIC AND CONSTRUCTION LOG

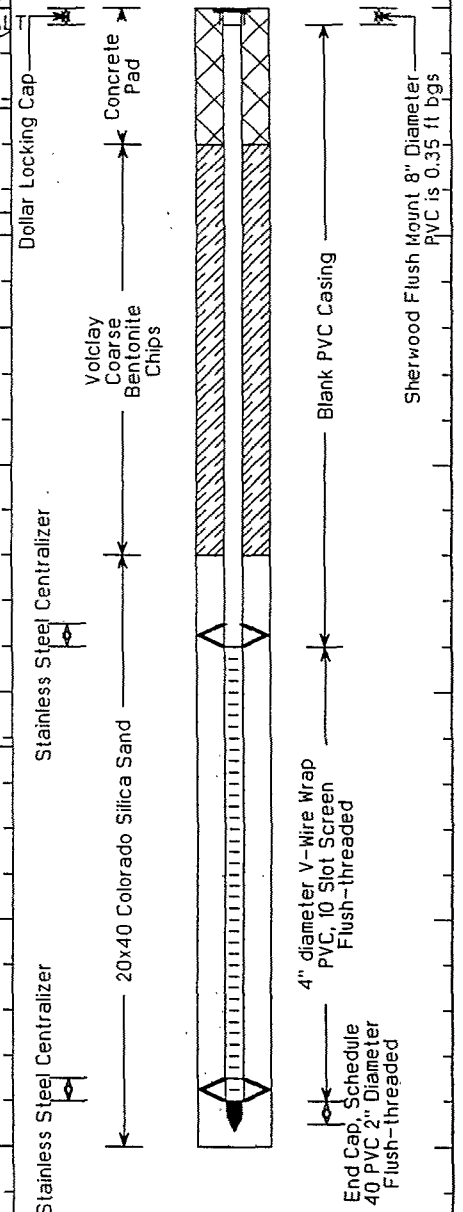
PROJECT Reynolds Metals LOCATION North Parking Lot

MEASURING POINT ELEV (NGVD) 28.38 DRILLING CONTRACTOR GeoTech-Mickey

DRILLING METHOD AND EQUIPMENT HSA 8 1/4" Augers Conterra 250

WATER LEVEL ELEV/DATE 13.13 7-14-94 START 7-9-94 FINISH 7-9-94 LOGGER Heidi Hoffmann

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY FEET	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	USCS DESCRIPTION
					Asphalt	ASPHALT
	2.5				SILTY SANDY GRAVEL, GM, v. dk brown, dry.	GM
	4.0	S-1	0.8	9-9-6 (15)	SILTY SAND, SM, v. dk grayish brown, (10YR 3/2), wet at bottom of ss, medium. OVM=0.0, HCN=0.0. Collect duplicate sample.	SM
5.0	5.0					
	6.5	S-2	1.0	4-6-11 (17)	SILT W/SAND, ML, v. dk grayish brown, (10YR 3/1), moist-wet in sand stringers, medium, sand is fine, silt is plastic. OVM=0.0, HCN=0.0.	ML
	7.5					
	9.0	S-3	1.4	5-9-9 (18)	SILTY SAND, SM, v. dk grayish brown, (10YR 3/2), v. sl. moist sand is fine, medium, mica flakes. OVM=0.0, HCN=0.0.	
10.0	10.0					
	11.5	S-4	1.3	4-5-6 (11)	SILTY SAND, SM, brown, (10YR 3/3), moist, wet at bottom of ss, medium, mica. OVM=0.0, HCN=0.0.	SM
	12.5					
	14.0	S-5	1.5	2-2-6 (8)	SILTY SAND, SM, brown, (10YR 3/3), wet, loose, mica. OVM=0.0, HCN=0.0.	
15.0	15.0					
	16.5	S-6	1.5	2-3-5 (8)	SILTY SAND, SM, brown, mottled with brown gray reduced areas, wet, loose. OVM=0.0, HCN=0.0.	
	17.5					
	19.0	S-7	1.5	4-3-3 (6)	SILT W/SAND, ML, dk. grayish brown, (10YR 3/2), wet, firm, mottled gray. ~10% Fe-oxide staining. OVM=0.0, HCN=0.0.	
20.0	20.0					
	21.5	S-8	1.5	2-2-6 (8)	SILT, ML, mottled gray and rust (Fe-oxide), wet, firm, interbedded with thin layers of fine silty sand and sandy silt, silt is stiff. OVM=0.0, HCN=0.0.	ML
	22.5					
	24.0	S-9	1.5	3-3-5 (8)	SANDY SILT, ML, mottled as above, wet, firm, sand is fine.	
25.0					BOH=25'	



WELL COMPLETION DIAGRAM

CH2M HILL

PROJECT NUMBER	WELL NUMBER
OPE39293.B1.01	MW-08 SHEET 1 OF 1

MONITORING WELL GEOLOGIC AND CONSTRUCTION LOG

PROJECT Reynolds Metals LOCATION Near Columbia River by Outlet of Company Lake

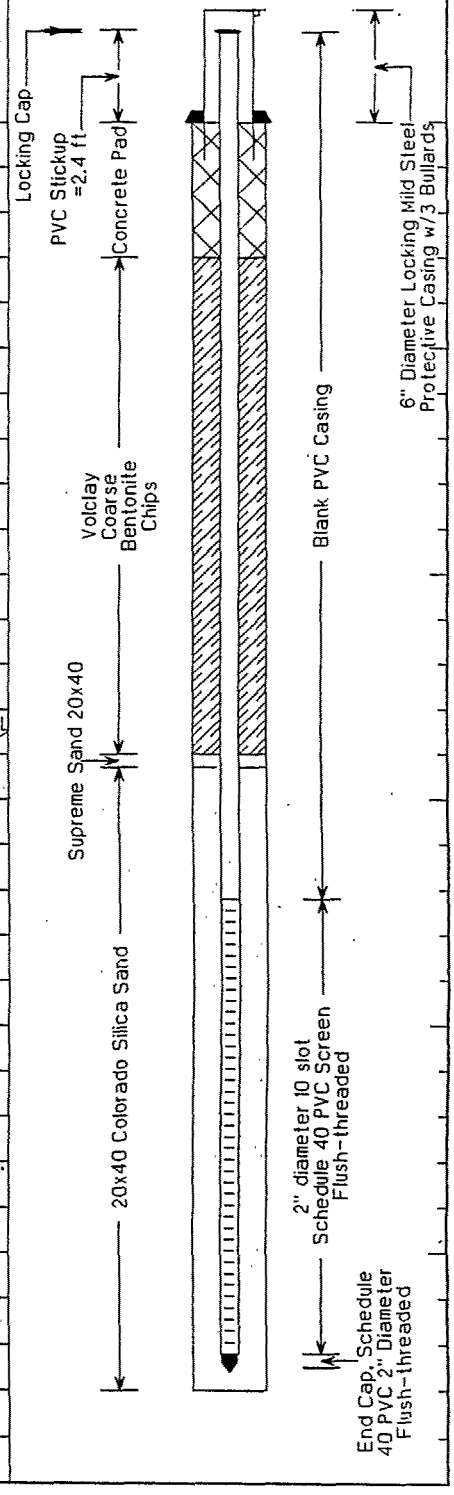
MEASURING POINT ELEV (NGVD) 25.32 DRILLING CONTRACTOR GeoTech-Mickey

DRILLING METHOD AND EQUIPMENT HSA 6 1/4" Augers Canterra 250

WATER LEVEL ELEV/DATE 17.24 7-12-94 START 7-7-94 FINISH 7-7-94 LOGGER Heidi Hoffmann

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY FEET	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	USCS DESCRIPTION
	2.5					
	4.0	S-1	1.5	Spoon broke	SILTY SAND, SM, dk brown, (10YR 3/3), v. sl. moist. OVM=0.0.	SM
	5.0					
5.0	6.5	S-2	1.5	7-8-12 (20)	SILTY SAND, SM, dk brown, (10YR 3/3), sl. moist, medium.	
	7.5				At 6.2': SAND, SP, salt & pepper, sl. moist, medium-coarse sand. OVM=0.0.	
	9.0	S-3	1.2	7-6-9 (15)	SAND, SP, salt & pepper, v. sl. moist, medium-coarse, medium. OVM=0.0.	SP
	10.0					
10.0	11.5	S-4	1.3	4-5-5 (10)	SAND, SP, salt & pepper w/red, v. sl. moist, loose. OVM=0.0.	
	12.5					
	14.0	S-5	1.3	5-7-8 (15)	SAND, SP, salt & pepper, moist-wet, medium, 6" of SM/ML, dk brown, (10YR 4/3), wet. OVM=0.0.	SM/ML
	15.0					
15.0	16.5	S-6	1.3	6-6-14 (20)	SAND, SP, salt & pepper, wet, medium, ~5% silt. OVM=0.0.	
	17.5					
	19.0	S-7	1.2	5-6-6 (12)	SAND, SP, salt & pepper, wet, medium, medium-coarse, loose. OVM=0.0.	
	20.0					
20.0	21.5	S-8	1.2	4-6-5 (11)	SAND, SP, same as above. OVM=0.0.	SP
	22.5					
	24.0	S-9	1.2	5-5-6 (11)	SAND, SP, same as above. OVM=1.1.	
	25.0					
25.0	26.5	S-10	1.1	7-7-14 (21)	SAND, SP, salt & pepper, wet, medium, ~5% subrounded pebbles. OVM=0.0.	
					BOH=28'	

WELL COMPLETION DIAGRAM



CH2M HILL

PROJECT NUMBER	WELL NUMBER
OPE39293.B1.01	MW-09 SHEET 1 OF 1

MONITORING WELL GEOLOGIC AND CONSTRUCTION LOG

PROJECT RMC Troutdale LOCATION N. Landfill

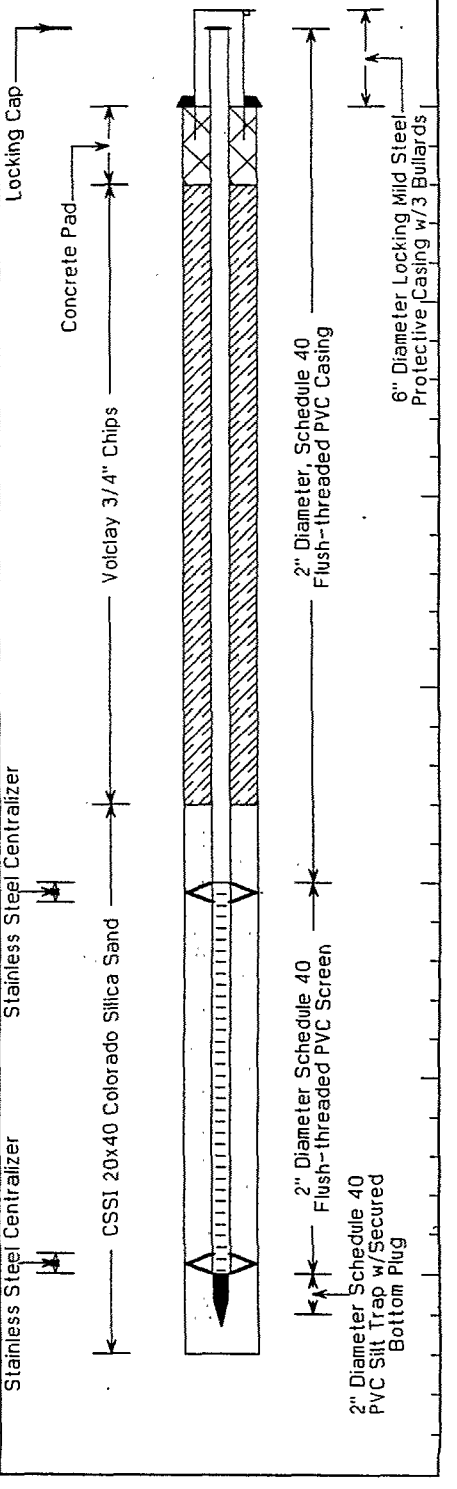
MEASURING POINT ELEV (NGVD) 29.27 DRILLING CONTRACTOR GeoTech Exploration

DRILLING METHOD AND EQUIPMENT 6 3/4" ID HSA

WATER LEVEL ELEV/DATE ____ START 8/4/94 8:30 AM FINISH ____ LOGGER Phil Brown

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY FEET	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION (SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY)	USCS DESCRIPTION
	2.5				SANDY SILT W/GRAVEL, SM, loamy. 5% gravel to 1" angular, basaltic, dry, lt. gray/brown, firm.	
	5.0			5-6-7 (13)	SILTY SAND, SM, lt. brown, damp, medium fine, some minor coarse salt and pepper sand.	SM
5.0	7.5			5-10-10 (20)	As above 6"; then coarser to med. Less silt, SM/SP, mottled reduction at base, some clay nodules (5%).	
	10.0			4-5-7 (12)	4" SM as above, then SAND, SP, medium, lt. brown, damp, loose.	
10.0	12.5			8-12-10 (22)	4" SM, brown/gray, mottled, damp firm. Then SAND, SP, salt & pepper, s. moist, medium-coarse, loose.	SP
	15.0			4-6-8 (14)	As above; moist to wet.	
15.0	17.5			9-9-8 (17)	SAND, SP, darker, coarser salt and pepper, more angular. Columbia River sand (?), v. moist.	
	20.0			6-8-9 (17)	As above. Wet at base, minor fine layer at 19.5'.	
20.0	22.5			3-6-7 (13)	As above, wet.	
	25.0			4-9-11 (20)	As above. 0.5" silt layer at 24', red staining below silt.	SP
25.0	27.5			3-4-5 (9)	As above. Silty clay layer=1.5' thick.	
30.0					SP as above. 6" recovery.	

WELL COMPLETION DIAGRAM



CHM HILL

PROJECT NUMBER	WELL NUMBER	
OPE39293.B1.01	MW-10	SHEET 1 OF 1

MONITORING WELL GEOLOGIC AND CONSTRUCTION LOG

PROJECT RMC Troutdale LOCATION Tank Area

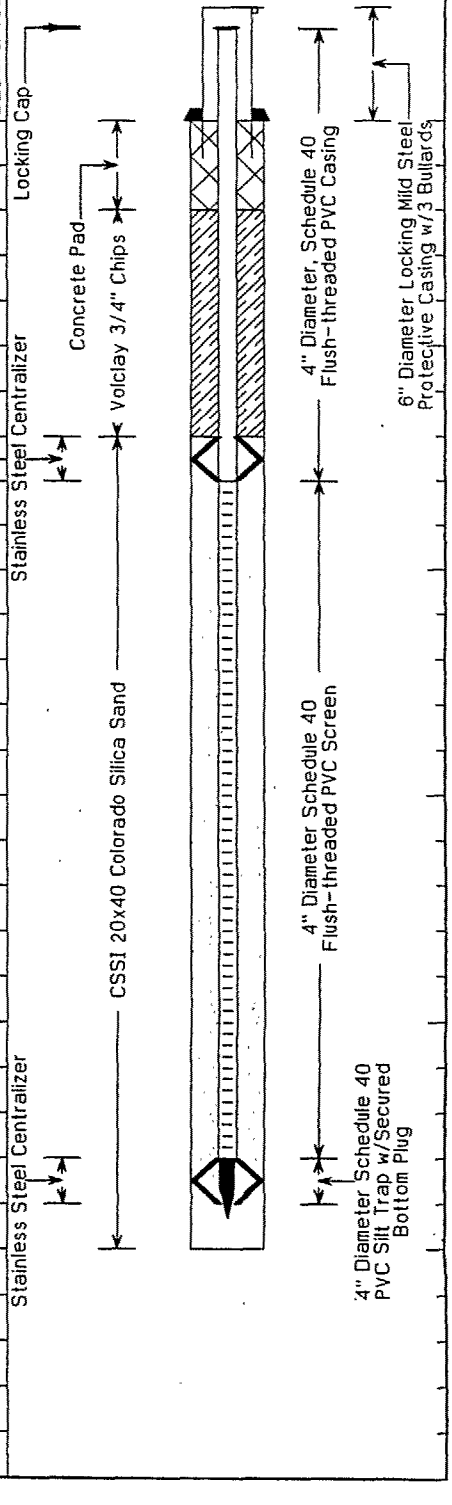
MEASURING POINT ELEV (NGVD) 30.28 DRILLING CONTRACTOR GeoTech Exploration

DRILLING METHOD AND EQUIPMENT 6 3/4" ID HSA

WATER LEVEL ELEV/DATE ____ START 8/5/94 8:30 AM FINISH ____ LOGGER Phil Brown

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY FEET	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION (SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY)	USCS DESCRIPTION
	2.5				Silty loam gray, dry, firm, roots and organic matter.	ML
	5.0			5-5-5 (10)	SILT W/SAND, ML, brown w/gray mottling, dry to damp, medium, roots, 30-40% very fine sand.	ML
5.0	7.5			3-7-5 (12)	SAND, SP, brown w/gray mottling, damp, loose, very fine, 30% silt.	SP
	10.0			4-3-3 (6)	SILT W/SAND, ML, brown w/gray mottling, moist, medium, increasing fine and plastic at 9'.	
10.0	12.5			1-3-2 (5)	SILT, ML, brown, moist to wet, medium, plastic, 10% very fine sand, 10% CL.	
	15.0			1-1-1 (3)	Same as above, wet, plastic, 10-20% CL.	
15.0	17.5			1-1-2 (3)	SILT, ML, as above, grayer, <5% sand, 10% clay.	ML
	20.0			0-0-2 (2)	SILT, ML, as above, some macro-pores, very wet.	
20.0	22.5			0-0-3 (3)	SILT, ML, as above.	
	25.0			1-2-3 (5)	SILT, ML, as above, gray w/brown mottling, 20% v. fine sand.	
25.0	27.5			1-2-4 (6)	SILT, ML, grading to sand (SP) at base, gray, wet, loose, sand very fine, 20% silt.	SP

WELL COMPLETION DIAGRAM



PROJECT NUMBER	WELL NUMBER
OPE39293.B1.01	MW-11 SHEET 1 OF 1

MONITORING WELL GEOLOGIC AND CONSTRUCTION LOG

PROJECT RMC Troutdale LOCATION East Gate

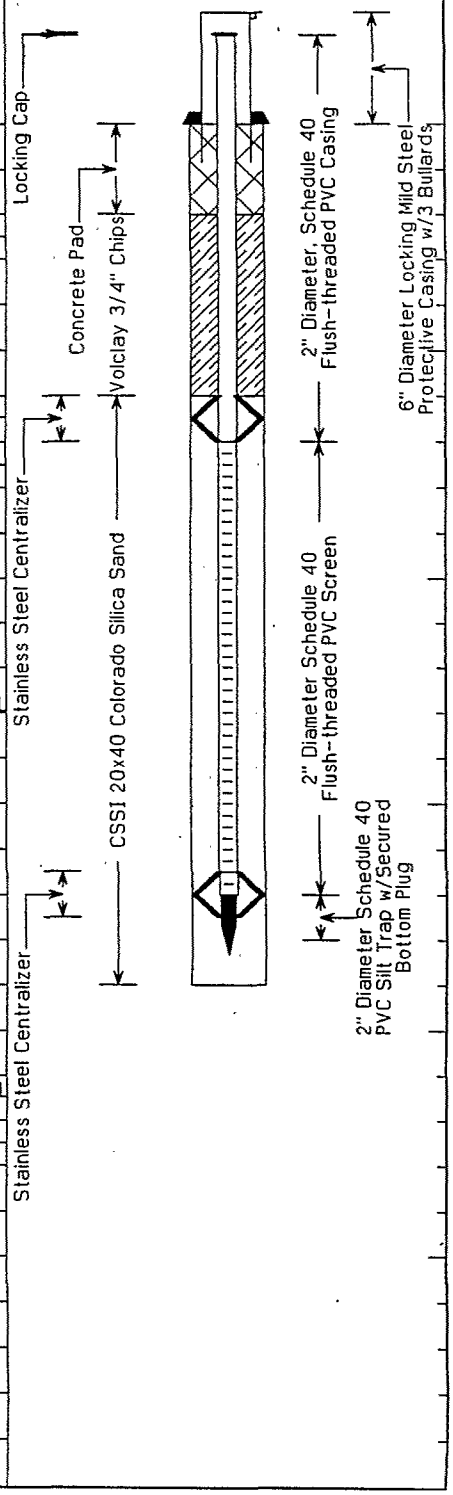
MEASURING POINT ELEV (NGVD) 31.61 DRILLING CONTRACTOR GeoTech Exploration

DRILLING METHOD AND EQUIPMENT 6 3/4" ID HSA

WATER LEVEL ELEV/DATE ____ START 8/4/94 FINISH 8/5/94 LOGGER Phil Brown

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY FEET	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION (SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY)	USCS DESCRIPTION
	2.5				SAND W/SILT AND GRAVEL, ML/SP/GW, fill, lt. gray to tan, dry, loose.	ML
	5.0			7-7-8 (15)	SAND, SP, brown damp, loose, no layering, medium-loose (fill).	SP
5.0	7.5			3-4-4 (8)	SILTY CLAY/CLAYEY SILT, ML/CL, brown w/red mottling, damp, dense. 5% fine sand.	ML/CL
	10.0			2-3-4 (7)	SAND W/SILT, SP, brown, wet, medium. 25% silt.	
10.0	12.5			2-2-2 (4)	SAND W/SILT, SP, as above; finer, closer to SP-ML.	
	15.0			1-2-3 (5)	SAND W/SILT, brown to gray, variable silt layering soft to medium gray.	SP/ML
15.0	17.5			2-2-2 (4)	Same as above.	
	20.0			1-2-3 (5)	Same as above. Last 6"=ML.	ML
20.0	22.5			2-4-3 (7)	Same as above; 1st 6" ML.	SP/ML
25.0						

WELL COMPLETION DIAGRAM



CH2M HILL

PROJECT NUMBER	WELL NUMBER
OPE39293.B1.01	MW-12 SHEET 1 OF 1

MONITORING WELL GEOLOGIC AND CONSTRUCTION LOG

PROJECT RMC Troutdale LOCATION SW Field

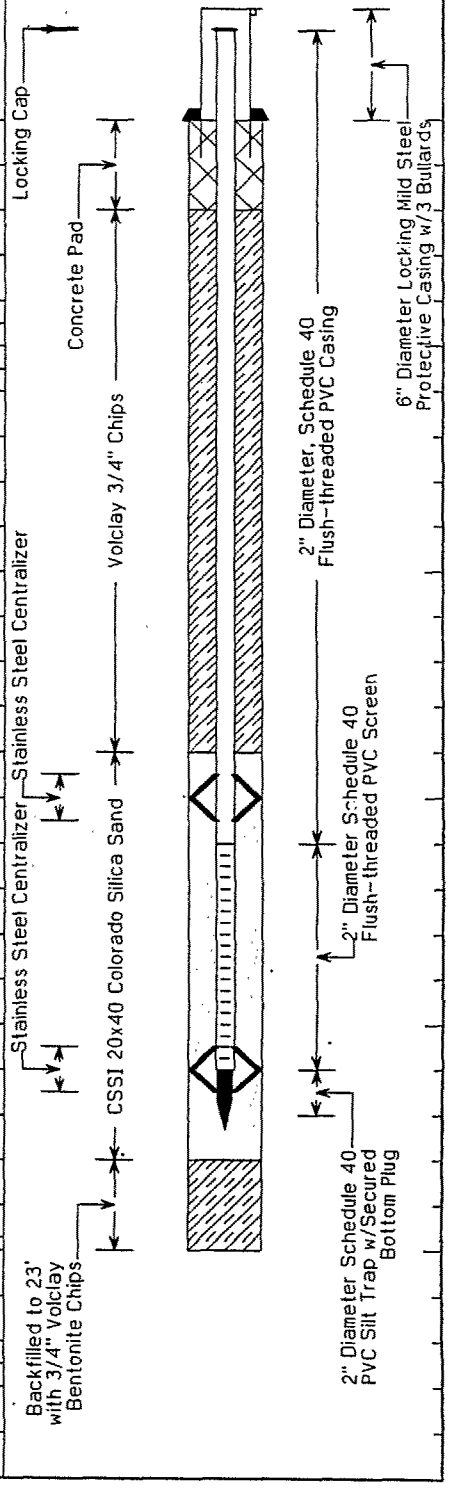
MEASURING POINT ELEV (NGVD) 22.53 DRILLING CONTRACTOR GeoTech Exploration

DRILLING METHOD AND EQUIPMENT 6 3/4" ID HSA

WATER LEVEL ELEV/DATE _____ START 8/4/94 FINISH _____ LOGGER Phil Brown

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SAMPLE RECOVERY FEET	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION (SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY)	USCS DESCRIPTION
	2.5				LOAMY SILT W/GRAVEL, ML, dry, lt. gray/brown, firm. <5% gravel. Angular basalt to 3/4" diameter.	
	5.0			4-7-9 (16)	SILT, ML, dk. gray to lt. gray/brown, dry to damp, firm. Some red staining, roots and organic debris. 5% very fine sand.	
5.0	7.5			6-6-3 (9)	Top 6": SAND, SP, fine to medium, lt. gray, moist, loose. Bottom 6": SILT, ML, gray, v. fine, wet, firm.	SP
	10.0			1-2-1 (3)	SILT, ML, gray, wet, soft, some root debris, 10-20% clay.	
10.0	12.5			1-2-1 (3)	SILT W/SAND, ML, gray, wet, soft. 20% v. fine black sand.	ML
	15.0			1-1-2 (3)	SILT, ML, as above. 20-25% clay, firmer.	
15.0	17.5			0-1-2 (3)	SAND W/SILT, SP, dk. gray, wet, soft to medium, v. fine sand, 30% silt (coarser).	SP
	20.0			1-2-2 (4)	1' same as above. Bottom 6": SAND, SP, medium to coarse, dk. gray, wet, soft, interlayered w/silt.	
20.0	22.5			1-1-2 (3)	SILT, ML, dk. gray, wet, firm, 15% v. fine sand, slightly plastic at base.	ML
	25.0			1-3-2 (5)	CLAYEY SILT, ML/CL, gray w/lt. green mottling, wet, soft to medium, much root debris and vegetation.	ML/CL
25.0					1' same as above. Bottom 6": SAND W/SILT, SP, dk. gray, wet, soft, medium to fine.	SP

WELL COMPLETION DIAGRAM



Appendix E

RMC Production Well and Sampled Offsite Well Geologic and Well Drillers' Logs

STATE ENGINEER
Salem, Oregon

MULT
001308

Well Record

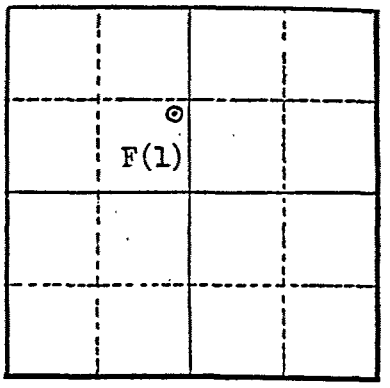
STATE WELL NO. 1N/3-23F(1)
COUNTY Multnomah
APPLICATION NO. GR- 462

OWNER: Reynolds Metals Co.
MAILING ADDRESS: Sundial Rd.
CITY AND STATE: Troutdale, Oregon

LOCATION OF WELL: Owner's No. 1

SE ¼ NW ¼ Sec. 23 T. 1 ~~N~~ S., R. 3 ~~E~~ W., W.M.

Bearing and distance from section or subdivision corner N.37°09'W. 2732' from SE cor. of sec. 23



Altitude at well 26'

TYPE OF WELL: Drilled Date Constructed May 1942

Depth drilled 282' Depth cased 282'

Section 23

CASING RECORD:
12 inch

FINISH:

AQUIFERS:

WATER LEVEL:
85 feet

PUMPING EQUIPMENT: Type Pamona 7 stage turbine H.P. 50
Capacity 735 G.P.M.

WELL TESTS:
Drawdown ..... ft. after ..... hours ..... G.P.M.
Drawdown ..... ft. after ..... hours ..... G.P.M.

USE OF WATER Industrial Temp. ..... °F. ....., 19.....
SOURCE OF INFORMATION GR- 445
DRILLER or DIGGER .....
ADDITIONAL DATA:
Log X Water Level Measurements ..... Chemical Analysis ..... Aquifer Test .....

REMARKS:

State Printing 89316

STATE ENGINEER
Salem, Oregon

State Well No. 1N/3-23F (1)
County Mult.
Application No. GR-462

Well Log

Owner: Reynolds Metals Co. Owner's No. #1

Driller: — Date Drilled Feb. 23, '42

CHARACTER OF MATERIAL	(Feet below land surface) From	To	Thickness (feet)
Top soil	0	1	1
Brown sandy clay	1	4	3
Soft blue silt & clay	4	25	21
Hard silt & sand	25	47	22
Sand with silt, blue	47	142	95
Scattered gravel in sand	142	150	8
Sand	150	230	80
Grey sand	230	261	31
Large gravel	261	264	3
Loose gravel - water	264	268	4
Conglomerate	268	278	10
Sand	278	282	4

STATE ENGINEER
Salem, Oregon

MULT Well Record

STATE WELL NO. 1N/3-23G(1)
COUNTY Multnomah
APPLICATION NO. GR-162

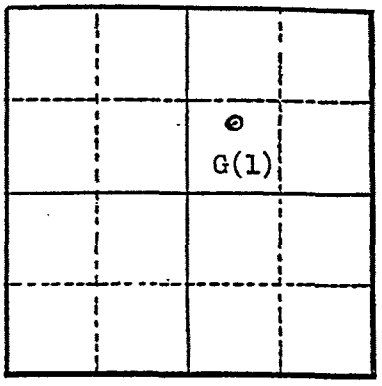
001322

OWNER: Reynolds Metals Co.
MAILING ADDRESS: Sundial Rd.
CITY AND STATE: Troutdale, Oregon

LOCATION OF WELL: Owner's No. 2
SW ¼ NE ¼ Sec. 23 T. 1 ~~S.~~ N. R. 3 ~~W.~~ E. W.M.

Bearing and distance from section or subdivision corner N. 3749', W. 1950' from SE cor. of sec. 23

Altitude at well 26'



TYPE OF WELL: Drilled Date Constructed 2/23/42
Depth drilled 268' Depth cased 268'
Section 23

CASING RECORD:
10 inch

FINISH:

AQUIFERS:

WATER LEVEL:
78 feet

PUMPING EQUIPMENT: Type Pamona, 7 stage turbine H.P. 40
Capacity 530 G.P.M.

WELL TESTS:
Drawdown 22 ft. after hours 530 G.P.M.
Drawdown ft. after hours G.P.M.

USE OF WATER Industrial Temp. °F., 19
SOURCE OF INFORMATION GR- 445
DRILLER or DIGGER
ADDITIONAL DATA:
Log X Water Level Measurements Chemical Analysis Aquifer Test

REMARKS:

State Printing 69316

STATE ENGINEER
Salem, Oregon

State Well No. 1N/2E-23C
County Mult.
Application No. GR-462

Well Log

Owner: Reynolds Metals Co. Owner's No. #2

Driller: Date Drilled Feb. 23, '42

CHARACTER OF MATERIAL	(Feet below land surface) From	To	Thickness (feet)
Top soil	0	2	2
Sand - some water	2	16	14
Silt & sand	16	32	16
Coarse sand	32	36	4
Fine sand	36	77	41
Sand with some gravel	77	87	10
Sand	87	145	58
Sand, some scattered gravel	145	157	12
Sand, some wood	157	165	8
Sand	165	181	16
Silt & sand	181	201	20
Coarse gravel with clay binder	201	214	13
Sand & gravel, with water	214	233	19
Blue clay	233	245	12
Gravel with clay binder	245	251	6
Very loose gravel - with water	251	258	7
Gravel with more sand	258	268	10

STATE ENGINEER
Salem, Oregon

MULT

Well Record

001323

STATE WELL NO. 1N/3-23G(2)
COUNTY Multnomah
APPLICATION NO. GR-462

OWNER: Reynolds Metals Co.

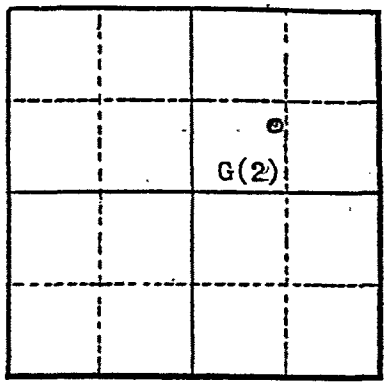
MAILING ADDRESS: Sundial Rd.

CITY AND STATE: Troutdale, Oregon

LOCATION OF WELL: Owner's No. 3

SW ¼ NE ¼ Sec. 23 T. 1 ~~S~~ N. R. 3 ~~W~~ E. W.M.

Bearing and distance from section or subdivision corner 3674' N. & 1534' W. from SE cor. of sec. 23



Altitude at well 28.5'

TYPE OF WELL: Drilled Date Constructed June '42

Depth drilled 281' Depth cased 281'

Section 23

CASING RECORD:
12 inch

FINISH:

AQUIFERS:

WATER LEVEL:
72 feet

PUMPING EQUIPMENT: Type Pamona, 4 stage turbine H.P. 40
Capacity 750 G.P.M.

WELL TESTS:
Drawdown 13 ft. after ____ hours 600 G.P.M.
Drawdown ____ ft. after ____ hours ____ G.P.M.

USE OF WATER Industrial Temp. ____ °F. ____, 19____
SOURCE OF INFORMATION GR- 445
DRILLER or DIGGER ____
ADDITIONAL DATA:
Log X Water Level Measurements ____ Chemical Analysis ____ Aquifer Test ____

REMARKS:

State Printing 89316

STATE ENGINEER
Salem, Oregon

State Well No. 1N3E-23CC
County Mult.
Application No. GR-462

Well Log

Owner: Reynolds Metals Co. Owner's No. #3

Driller: Date Drilled June '42

CHARACTER OF MATERIAL	(Feet below land surface) From	To	Thickness (feet)
Dredge sand from river	0	5	5
Coarse sand	5	18	13
Blue silt	18	25	7
Hard sandstone	25	70	45
Sand	70	194	124
Cemented gravel	194	197	3
Blue clay	197	224	27
Cemented gravel	224	227	4
Blue clay	227	243	16
Cemented gravel	243	245	2
Sandy gravel	245	248	3
Cemented gravel	248	252	4
Gravel - water bearing	252	261	9
Coarse grey sand	261	273	12
Cemented gravel	273	275	2
Sand	275	277	2
Conglomerate	277	280	3
Brown clay	280	281	1

STATE ENGINEER
Salem, Oregon

MULT **Well Record**

001328

STATE WELL NO. 1N/3-23H(1)
COUNTY Multnomah
APPLICATION NO. GR- 462

OWNER: Reynolds Metals Co.

MAILING ADDRESS: Sundial Rd.

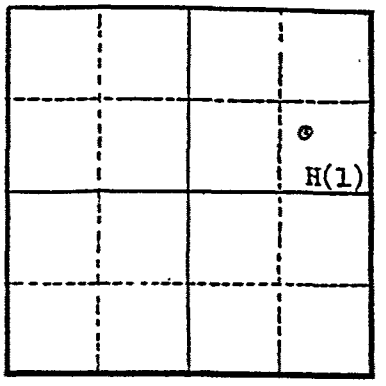
CITY AND STATE: Troutdale, Oregon

LOCATION OF WELL: Owner's No. 4

SE ¼ NE ¼ Sec. 23 T. 1 N. R. 3 E. W.M.

Bearing and distance from section or subdivision corner 3540'.N. & 967' W. from SE cor. sec. 23

Altitude at well 28.5'



TYPE OF WELL: Drilled Date Constructed 8/3/42

Depth drilled 190' Depth cased 190'

Section 23

CASING RECORD:
12 inch

FINISH:

AQUIFERS:

WATER LEVEL:
53 feet

PUMPING EQUIPMENT: Type P. M., 8 stage turbine H.P. 75
Capacity 980 G.P.M.

WELL TESTS:
Drawdown 22 ft. after hours 1040 G.P.M

Drawdown ft. after hours G.P.M

USE OF WATER Industrial Temp. °F., 19
SOURCE OF INFORMATION GR- 445
DRILLER or DIGGER
ADDITIONAL DATA:
Log X Water Level Measurements Chemical Analysis Aquifer Test

REMARKS:

State Printing 89316

STATE ENGINEER
Salem, Oregon

State Well No. 1N/3-29 1N
County Mult.
Application No. GR-462

Well Log

Owner: Reynolds (Metals) Metals Co. Owner's No. #4

Driller: ——— Date Drilled Aug. 3, '42

CHARACTER OF MATERIAL	(Feet below land surface) From	To	Thickness (feet)
Dredge sand from river	0	3	3
Yellow silt	3	12	9
Blue silt	12	25	13
Grey sand	25	159	134
Large conglomerate gravel	159	164	5
Gravel - water bearing	164	175	11
Coarse Sand	175	177	2
Gravel with clay binder	177	190	13

STATE ENGINEER
Salem, Oregon

MULT **Well Record**

STATE WELL NO. 1N/3-23H(2)
COUNTY Multnomah
APPLICATION NO. GR- 462

OWNER: Reynolds Metals Co. 001331

MAILING ADDRESS: Sundial Rd.

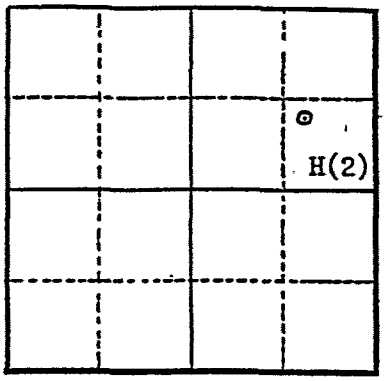
CITY AND STATE: Troutdale, Oregon

LOCATION OF WELL: Owner's No. 5

SE ¼ NE ¼ Sec. 23 T. 1 N. R. 3 E. W.M.

Bearing and distance from section or subdivision corner 3740' N. & 1015' W. from SE cor. sec. 23

Altitude at well 28.5'



Section 23

TYPE OF WELL: Drilled Date Constructed Apr. 1943

Depth drilled 330' Depth cased 277'

CASING RECORD:
16 inch

FINISH:

AQUIFERS:

WATER LEVEL:
60 feet

PUMPING EQUIPMENT: Type Pamona, 7 stage turbine H.P. 150
Capacity 1500 G.P.M.

WELL TESTS:
Drawdown 20 ft. after hours 1900 G.P.M.
Drawdown ft. after hours G.P.M.

USE OF WATER Industrial Temp. °F., 19
SOURCE OF INFORMATION GR- 445
DRILLER or DIGGER
ADDITIONAL DATA:
Log X Water Level Measurements Chemical Analysis Aquifer Test

REMARKS:

State Printing 89316

STATE ENGINEER
Salem, Oregon

State Well No. 1N/3-23H(2)
County Mult.
Application No. GR-462

Well Log

Owner: Reynolds Metals Co. Owner's No. # 5

Driller: — Date Drilled April 43

CHARACTER OF MATERIAL	(Feet below land surface) From	To	Thickness (feet)
Top soil	0	2	2
Clay, some silt	2	45	43
Silt, sand, & clay	45	150	105
Cemented large gravel	150	167	17
Loose sand & gravel - water	167	185	18
Some clay in gravel	185	190	5
Gravel with clay binder	190	220	30
Blue clay & sand	220	243	23
Gravel, very tight - may have water	243	253	10
Gray sand	253	263	10
Clay	263	265	2
Sand & silt - scattering of gravel	265	285	20
Blue clay	285	300	15
Sandstone	300	330	30

STATE ENGINEER
Salem, Oregon

MULT 061311

Well Record

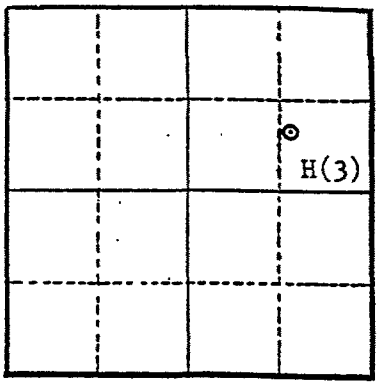
STATE WELL NO. 1N/3-23H(3)
COUNTY Multnomah
APPLICATION NO. GR- 462

OWNER: Reynolds Metals Co.
MAILING ADDRESS: Sundial Rd.
CITY AND STATE: Troutdale, Oregon

LOCATION OF WELL: Owner's No. 6

SE ¼ NE ¼ Sec. 23 T. 1 ~~S~~ N. R. 3 ~~W~~ E. W.M.

Bearing and distance from section or subdivision corner 3559' N. & 1157' W. from SE cor sec. 23



Section 23

Altitude at well 28.5'

TYPE OF WELL: Drilled Date Constructed 2/27/48

Depth drilled 279' Depth cased 279'

CASING RECORD:
18 inch from 0 to 193 feet
12 inch from 180 to 279 feet

FINISH:

AQUIFERS:

WATER LEVEL:
55 feet

PUMPING EQUIPMENT: Type F. M., 5 stage turbine H.P. 60
Capacity 1000 G.P.M.

WELL TESTS:
Drawdown ..... ft. after ..... hours ..... G.P.M.
Drawdown ..... ft. after ..... hours ..... G.P.M.

USE OF WATER Industrial Temp. ..... °F. ....., 19.....
SOURCE OF INFORMATION GR- 445
DRILLER or DIGGER .....
ADDITIONAL DATA:
Log X Water Level Measurements ..... Chemical Analysis ..... Aquifer Test .....

REMARKS:

State Printing 89316

STATE ENGINEER
Salem, Oregon

State Well No. 11/3-25H(3)
County Mult.
Application No. GR-4[illegible]

Well Log

Owner: Reynolds ~~Metals~~ Metals Co. Owner's No. #6

Driller: — Date Drilled Feb. 27, '48

CHARACTER OF MATERIAL	(Feet below land surface) From	To	Thickness (feet)
Dredge sand from river	0	6	6
Blue silt	6	35	29
Hard blue clay	35	50	15
Sand silt & clay	50	169	119
Blue clay	169	176	7
Cemented gravel	176	193	17
Coarse sand - water	193	200	7
Loose sand & gravel - water	200	206	6
Sand & clay	206	235	29
Blue clay	235	250	15
Cemented gravel	250	258	8
Sand	258	262	4
Cemented gravel	262	268	6
Loose sand & clay - water	268	277	9
Cemented gravel with brown clay binder	277	279	2

STATE ENGINEER
Salem, Oregon

MULT 061329

Well Record

STATE WELL NO. 1N/3-23H(4)
COUNTY Multnomah
APPLICATION NO. GR- 462

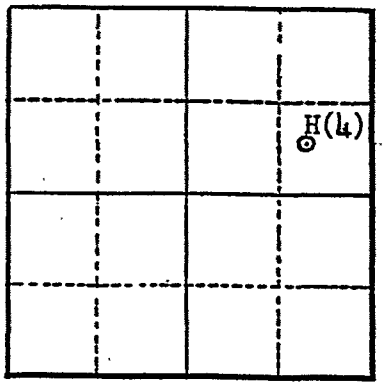
OWNER: Reynolds Metals Co.
MAILING ADDRESS: Sundial Rd.
CITY AND STATE: Troutdale, Oregon

LOCATION OF WELL: Owner's No. 7

SE ¼ NE ¼ Sec. 23 T. 1 N. R. 3 E. W.M.

Bearing and distance from section or subdivision corner 3404' N. & 947' W. from SE cor. sec. 23

Altitude at well 28.5'



TYPE OF WELL: Drilled Date Constructed 5/12/48

Depth drilled 254' Depth cased 254'

Section 23

CASING RECORD:
18 inch from 0 to 203 feet
12 inch from 190 to 254 feet

FINISH:

AQUIFERS:

WATER LEVEL:
70 feet

PUMPING EQUIPMENT: Type F. M., 5 stage turbine H.P. 60
Capacity 1000 G.P.M.

WELL TESTS:
Drawdown ..... ft. after ..... hours ..... G.P.M.
Drawdown ..... ft. after ..... hours ..... G.P.M.

USE OF WATER Industrial Temp. ..... °F. ....., 19.....
SOURCE OF INFORMATION GR- 1415
DRILLER or DIGGER .....
ADDITIONAL DATA:
Log X Water Level Measurements ..... Chemical Analysis ..... Aquifer Test .....

REMARKS:

State Printing 80316

STATE ENGINEER
Salem, Oregon

State Well No. [illegible]
County Multnomah
Application No. GR 216

Well Log

Owner: Reynolds ~~Metals~~ Metals Co. Owner's No. [illegible]

Driller: ..... Date Drilled May 12, 45

CHARACTER OF MATERIAL	(Feet below land surface) From	To	Thickness (feet)
Dredge sand from river	0	4	4
Blue silt	4	32	28
Blue clay	32	39	7
Brown sand	39	156	117
Blue clay	156	170	14
Brown clay	170	176	6
Grey sand	176	184	8
Cemented gravel	184	187	3
Sticky green clay	187	198	11
Cemented gravel	198	206	8
Coarse sand, small gravel, white clay binder	206	218	12
Blue clay	218	226	8
Brown clay	226	236	10
Loose gravel & sand — water bearing	236	246	10
Sand with clay binder	246	254	8

STATE ENGINEER
Salem, Oregon

MULT **Well Record**

001330

STATE WELL NO. 1N/3-23H(5)
COUNTY Multnomah
APPLICATION NO. GR- 462

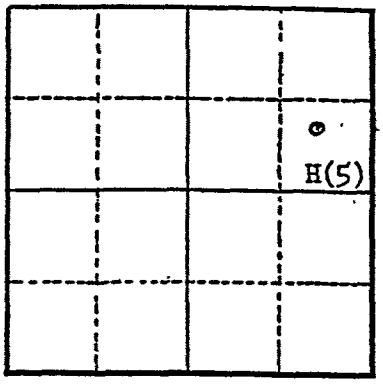
OWNER: Reynolds Metals Co.
MAILING ADDRESS: Sundial Rd.
CITY AND STATE: Troutdale, Oregon

LOCATION OF WELL: Owner's No. 8

SE ¼ NE ¼ Sec. 23 T. 1 N. R. 3 E. W.M.

Bearing and distance from section or subdivision corner 3581' N. & 804' W. from SE cor. sec. 23

Altitude at well 28.5'



TYPE OF WELL: Drilled Date Constructed 9/21/48

Depth drilled 248' Depth cased 248'

Section 23

CASING RECORD:
18 inch from 0 to 160 feet
12 inch from 152 to 248 feet

FINISH:

AQUIFERS:

WATER LEVEL:
60 feet

PUMPING EQUIPMENT: Type F. M., 5 stage turbine H.P. 60
Capacity 1000 G.P.M.

WELL TESTS:
Drawdown ..... ft. after ..... hours ..... G.P.M.
Drawdown ..... ft. after ..... hours ..... G.P.M.

USE OF WATER Industrial Temp. ..... °F. ....., 19.....
SOURCE OF INFORMATION GR- 445
DRILLER or DIGGER .....
ADDITIONAL DATA:
Log X Water Level Measurements ..... Chemical Analysis ..... Aquifer Test .....

REMARKS:

State Printing 89316

STATE ENGINEER
Salem, Oregon

State Well No. 1N/3E-23H
County Multnomah
Application No. GR-162

Well Log

Owner: Reynolds Metals Co. (Mead) Owner's No. #8

Driller: _____ Date Drilled Sept. 21, '48

CHARACTER OF MATERIAL	(Feet below land surface) From	To	Thickness (feet)
Dredge sand from river	0	3	3
Blue silt & sand	3	34	31
Blue clay	34	43	9
Brown silt & sand	43	148	145
Cemented gravel	148	151	3
Grey sand	151	158	7
Loose sand & gravel - some water	158	166	8
Grey sand	166	192	26
Loose sand & gravel - water bearing	192	215	23
Cemented gravel	215	218	3
Loose sand & gravel water-bearing	218	235	17
Sand & silt	235	248	13

STATE ENGINEER
Salem, Oregon

MULT
001324

Well Record

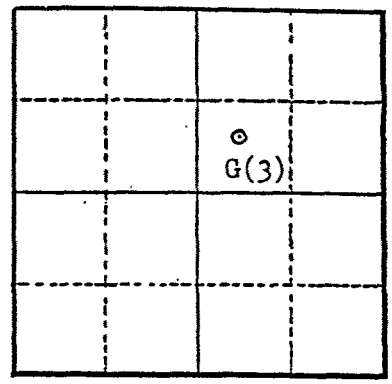
STATE WELL NO. 1N/3-23G(3)
COUNTY Multnomah
APPLICATION NO. GR- 462

OWNER: Reynolds Metals Co.
MAILING ADDRESS: Sundial Rd.
CITY AND STATE: Troutdale, Oregon

LOCATION OF WELL: Owner's No. 9

SW ¼ NE ¼ Sec. 23 T. 1 ~~S~~ N., R. 3 ~~W~~ E., W.M.

Bearing and distance from section or subdivision corner 3459' N. & 1744' W. from SE cor. sec. 23



Altitude at well 28.5'

TYPE OF WELL: Drilled Date Constructed 7/23/49

Depth drilled 295' Depth cased 295'

Section 23

CASING RECORD:
20 inch from 0 to 136½ feet
12 inch from 128 to 295 feet

FINISH:

AQUIFERS:

WATER LEVEL:
105 feet

PUMPING EQUIPMENT: Type Peerless, 2 stage turbine H.P. 40
Capacity 1200 G.P.M.

WELL TESTS:
Drawdown ..... ft. after ..... hours ..... G.P.M.
Drawdown ..... ft. after ..... hours ..... G.P.M.

USE OF WATER Industrial Temp. ..... °F. ....., 19....
SOURCE OF INFORMATION GR- 445
DRILLER or DIGGER .....
ADDITIONAL DATA:
Log X Water Level Measurements ..... Chemical Analysis ..... Aquifer Test .....

REMARKS:
After development of well at 295' silt condition could not be remedied. Well was back filled to 180' before pump test.

State Printing 89316

STATE ENGINEER
Salem, Oregon

State Well No. 1N/2-35C
County Multnomah
Application No. G-[illegible]

Well Log

Owner: Reynolds (Metals) Metals Co. Owner's No. #3

Driller: — Date Drilled July 23, 19[illegible]

CHARACTER OF MATERIAL	(Feet below land surface) From	To	Thickness (feet)
Dredge sand from river	0	6	6
Brown sandy clay	6	33	27
Blue clay, ~~sandy~~	33	39	6
Fine gray sand, packed	39	155	116
Gray sand, water-bearing	155	179	24
Gray packed sand	179	191	12
Gray silt	191	226	35
Sticky blue clay	226	250	24
Cemented gravel, gray binder	250	276	26
Heavy brown sand, water-bearing	276	278	2
Loose sand & gravel	278	288	10
Cemented sand & gravel	288	293	5
Brown clay	293	295	2

STATE ENGINEER
Salem, Oregon

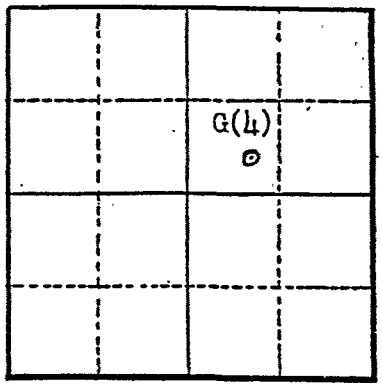
MULT
001320

Well Record

STATE WELL NO. 1N/3-23G(4)
COUNTY Multnomah
APPLICATION NO. GR-462

OWNER: Reynolds Metals Co.
MAILING ADDRESS: Sundial Rd.
CITY AND STATE: Troutdale, Oregon

LOCATION OF WELL: Owner's No. 10
SW ¼ NE ¼ Sec. 23 T. 1 N. S., R. 3 E. W., W.M.
Bearing and distance from section or subdivision corner 3198' N. & 1754' W. from SE cor. sec. 23



Altitude at well 28.5'

TYPE OF WELL: Drilled Date Constructed 8/17/49
Depth drilled 625' Depth cased 625'
Section 23

CASING RECORD:
20 inch from 0 to 140 feet
12 inch from 0 to 625 feet

FINISH:
Perforated from 144 to 185 feet - shut off when well was redrilled to 625'

AQUIFERS:

WATER LEVEL:
78 feet (1955)

PUMPING EQUIPMENT: Type Peerless, 3 stage turbine H.P. 60
Capacity 1180 G.P.M.

WELL TESTS:
Drawdown 40 ft. after hours 900 G.P.M.
Drawdown 48 ft. after hours 1100 G.P.M.

USE OF WATER Industrial Temp. °F., 19
SOURCE OF INFORMATION GR-445
DRILLER or DIGGER
ADDITIONAL DATA:
Log X Water Level Measurements Chemical Analysis Aquifer Test

REMARKS:

State Printing 69316

STATE ENGINEER
Salem, Oregon

State Well No. 1N/1-22G(4
County Mult.
Application No. GR-462

Well Log

Owner: Reynolds ~~Metals~~ Metals Co. Owner's No. #10

Driller: — Date Drilled Aug. 17 '49

CHARACTER OF MATERIAL	(Feet below land surface) From	To	Thickness (feet)
Dredge sand from river	0	6	6
Brown sand	6	16	10
Blue clay	16	19	3
Brown sand	19	42	23
Gray sandy clay	42	62	20
Cemented gravel, gray binder	62	81	19
Gray silt & sand - ~~water~~ bearing	81	144	63
Gray sand - water bearing	144	165	21
Cemented gravel	165	168	3
Gray sand - water bearing	168	186	18
Gray silt	186	190	4
Blue sandy silt	190	206	16
Hard packed sand	206	227	21
Sandy silt	227	238	11
Coarse sand & gravel	238	244	6
Blue clay	244	252	8
Hard packed sand - some gravel	252	337	85
Sandy silt & gravel	337	342	5
Hard packed sand	342	372	30
Sandy clay	372	377	5
Hard packed sand & gravel	377	385	8
Sandy clay	385	392	7

STATE ENGINEER
Salem, Oregon

State Well No. 1N-3-25G
County Linn.
Application No. GR-460

Well Log

Owner: Reynolds Metals Co. Owner's No. #10

Driller: ..... Date Drilled —

CHARACTER OF MATERIAL	(Feet below land surface) From	To	Thickness (feet)
Sandy silt	392	401	9
Packed sand	401	416	15
Blue clay	416	421	5
Packed sand	421	432	11
Sandy clay & gravel	432	461	29
Cemented gravel	461	472	11
Sand & gravel-water bearing	472	482	10
Cemented gravel	482	513	31
Dirty sand & gravel, smal	513	520	7
Sand, gravel - water	520	532	12
Blue silt	532	539	7
Sand, gravel - water	539	559	20
Silt with small amount gravel	559	570	11
Blue clay	570	587	17
Hard shale	587	625	38

STATE ENGINEER
Salem, Oregon

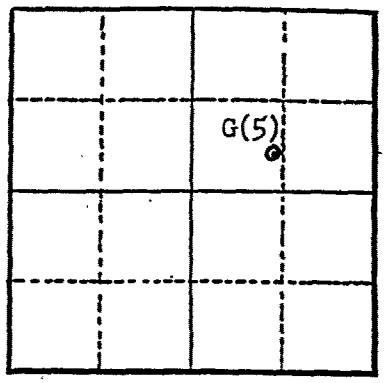
MULT Well Record
661325

STATE WELL NO. 1N/3-23G(5)
COUNTY Multnomah
APPLICATION NO. GR- 462

OWNER: Reynolds Metals Co.
MAILING ADDRESS: Sundial Rd.
CITY AND STATE: Troutdale, Oregon

LOCATION OF WELL: Owner's No. 11
SW ¼ NE ¼ Sec. 23 T. 1 ~~N~~ S., R. 3 ~~E~~ W., W.M.
Bearing and distance from section or subdivision corner 3246' N. & 1474' W. from SE cor. sec. 23

Altitude at well 28.5'



TYPE OF WELL: Drilled Date Constructed 8/17/49
Depth drilled 592' Depth cased 541'
Section 23

CASING RECORD:
20 inch from 0 to 147 feet
12 inch from 0 to 541 feet

FINISH:
Perforated from 147 to 187 feet - shut off when well was redrilled to 592' (2/16/55)

AQUIFERS:

WATER LEVEL:
45 feet

PUMPING EQUIPMENT: Type Peerless, 3 stage turbine H.P. 60
Capacity 1180 G.P.M.

WELL TESTS:
Drawdown 77 ft. after ____ hours 1000 G.P.M.
Drawdown 93 ft. after ____ hours 1200 G.P.M.

USE OF WATER Industrial Temp. ____ °F. ____, 19____
SOURCE OF INFORMATION GR- 445
DRILLER or DIGGER
ADDITIONAL DATA:
Log X Water Level Measurements ____ Chemical Analysis ____ Aquifer Test ____

REMARKS:

State Printing 89316

STATE ENGINEER
Salem, Oregon

State Well No. [illegible]
County Multnomah
Application No. GR 4652

Well Log

Owner: Reynolds Metals (metals) Co. Owner's No. #11

Driller: —— Date Drilled Aug. 17, 1949

CHARACTER OF MATERIAL	(Feet below land surface) From	To	Thickness (feet)
Dredge sand from river	0	8	8
Sandy clay	8	14	6
Brown clay	14	32	18
Brown silt	32	68	36
Brown silt & very fine gray sand	68	143	75
Hard brown silty clay	143	152	9
Gray sand & small gravel water bearing	152	167	15
~~Gray sand~~ Cemented gravel	167	171	4
Gray sand - water bearing	171	178	7
Cemented gravel	178	183	5
Gray silt	183	188	5
Blue "	188	202	14
Gravel sandy clay binder	202	207	5
Sandy clay	207	219	12
Hard packed sand	219	232	13
Sandy silt	232	239	7
Hard packed sand - small amount gravel	239	274	35
Sandy silt.	274	286	12
Hard packed sand - some gravel	286	307	21
Silty sand - some gravel	307	362	55
Black shale	362	365	3

STATE ENGINEER
Salem, Oregon

State Well No. [illegible]
County [illegible]
Application No. [illegible]

Well Log

Owner: Reynolds Metals Co. Owner's No. #11

Driller: — Date Drilled —

CHARACTER OF MATERIAL	(Feet below land surface) From	To	Thickness (feet)
Sandy clay	365	383	18
Sand & small amount of gravel with clay binder	383	407	24
Cemented gravel	407	416	9
Sand & gravel-water bearing	416	447	31
Fine sand	447	485	38
Tight gravel	485	498	13
Sand & gravel, clay binder	498	507	9
Sand with some gravel-water	507	520	13
Sand & gravel-clay binder	520	533	13
Cemented gravel	533	561	28
Shale	561	592	31

STATE ENGINEER
Salem, Oregon

MULT Well Record

001319

STATE WELL NO. 1N/3-23K1 db
COUNTY MULTNOMAH
APPLICATION NO.

OWNER: Reynolds Metals Co.

MAILING ADDRESS:

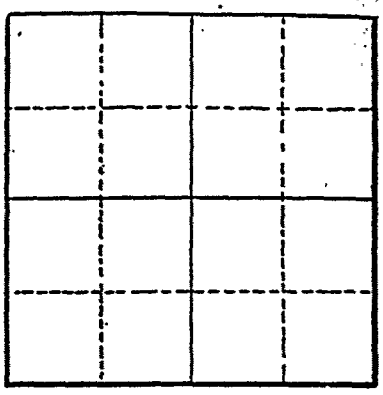
CITY AND STATE:

LOCATION OF WELL: Owner's No. #12

____¼ ____¼ Sec. ____ T. ____ N. S., R. ____ E. W., W.M.

Bearing and distance from section or subdivision corner

Altitude at well 28



TYPE OF WELL: Drilled Date Constructed

Depth drilled 615 Depth cased 590

Section

CASING RECORD:

20-12 inch

FINISH:

AQUIFERS: Sand, Gravel, Troutdale Formation, from 156 to 187
Sand, Troutdale Formation, from 230 to 234
Sand, Gravel, Troutdale Formation, from 507 to 577

WATER LEVEL:
23 feet below land surface, September, 1949

PUMPING EQUIPMENT: Type Turbine H.P.
Capacity 1,200 G.P.M.

WELL TESTS:
Drawdown ____ ft. after ____ hours ____ G.P.M.
Drawdown ____ ft. after ____ hours ____ G.P.M.

USE OF WATER Industrial Temp. ____ °F. ____, 19____
SOURCE OF INFORMATION USGS
DRILLER or DIGGER
ADDITIONAL DATA:
Log X Water Level Measurements ____ Chemical Analysis X Aquifer Test ____

REMARKS:

Perforated 512-518, 522-538, 544-555, and 563-578 feet.

STATE ENGINEER
Salem, Oregon

State Well No. 1N/3-23K1 ab
County MULTNOMAH
Application No.

Well Log

Owner: Reynolds Metals Co. Owner's No. PW12

Driller: R. J. Strasser Drilling Co. Date Drilled 1949 and 1954

CHARACTER OF MATERIAL	(Feet below land surface) From	To	Thickness (feet)
Artificial fill and younger alluvium:			
Fill and soil	0	24	24
Younger alluvium:			
Silt and clay	24	42	18
Sand, brown	42	54	12
Sand, fine, gray	54	143	89
Sand, coarse, gray, some clay	143	156	13
Troutdale Formation:			
Sand, coarse, some gravel, water-bearing	156	187	31
Sand and clay, gray	187	230	43
Sand, in part water-bearing	230	234	4
Sand and clay, blue	234	265	31
Shale, blue	265	281	16
Clay and sand	281	305	24
Sand, fine with scattered gravel	305	352	47
Sand and clay, gray	352	361	9
Shale and sand, black	361	384	23
Clay, brown	384	396	12
Sandstone	396	409	13
Sand and clay, with some gravel	409	420	11
Sand, hard-packed, with some clay	420	446	26
Clay and gravel	446	474	28
Clay, sandy	474	487	13
Sandstone	487	507	20

Continued--

STATE ENGINEER
Salem, Oregon

State Well No. 1N/3-23K1 dd
County
Application No.

Well Log

Owner: Reynolds Metals Co. Owner's No. Plant 2

Driller: Date Drilled

CHARACTER OF MATERIAL	(Feet below land surface) From	To	Thickness (feet)
Sand and gravel, loose, water-bearing	507	577	70
Gravel, cemented	577	597	20
Sand and silt	597	606	9
Clay, blue, hard	606	615	9

STATE ENGINEER
Salem, Oregon

MULT 001326

Well Record

STATE WELL NO. 1N/3-23G(6)
COUNTY Multnomah
APPLICATION NO. GR- 462

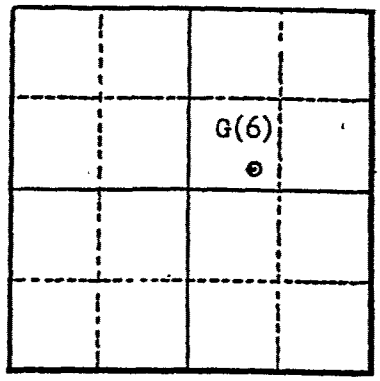
OWNER: Reynolds Metals Co.
MAILING ADDRESS: Sundial Rd.
CITY AND STATE: Troutdale, Oregon

LOCATION OF WELL: Owner's No. 12

SW ¼ NE ¼ Sec. 23 T. 1 ~~N.~~ S., R. 3 ~~E.~~ W., W.M.

Bearing and distance from section or subdivision corner 2944' N. & 1719' W. from SE cor. sec. 23

Altitude at well 28.5'



TYPE OF WELL: Drilled Date Constructed 9/13/49

Depth drilled 616' Depth cased 590'

Section 23

CASING RECORD:

20 inch from 0 to 140 feet
16 inch from 80 to 392 feet
12 inch from 0 to 590 feet

FINISH:

Perforated from 147 to 187 feet - shut off when well was redrilled on 3/18/54 to 616 feet. Hole backfilled with gravel from 616 to 584 feet to seal off fine sand strata from 598 to 607 feet.

AQUIFERS:

WATER LEVEL:

39 feet

PUMPING EQUIPMENT: Type Peerless, 3 stage turbine H.P. 60

Capacity 1180 G.P.M.

WELL TESTS:

Drawdown 71 ft. after ____ hours 1000 G.P.M.

Drawdown 80 ft. after ____ hours 1200 G.P.M.

USE OF WATER Industrial Temp. ____ °F. ____, 19____

SOURCE OF INFORMATION GR- 445

DRILLER or DIGGER

ADDITIONAL DATA:

Log X Water Level Measurements ____ Chemical Analysis ____ Aquifer Test ____

REMARKS:

State Printing 80316

STATE ENGINEER
Salem, Oregon

State Well No. 1N/4W-25K
County Multnomah
Application No. G2-7652

Well Log

Owner: Reynolds ~~Metals~~ Metal Co. Owner's No. 3412

Driller: ..... Date Drilled Sept. 15, 49

CHARACTER OF MATERIAL	(Feet below land surface) From	To	Thickness (feet)
Dredge sand from river	0	5	5
Fine brown silt	5	19	14
Blue silt	19	26	7
Brown clay	26	37	11
Hard blue clay	37	42	5
Brown sand	42	54	12
Fine gray sand	54	143	89
Coarse gray sand, some binder	143	156	13
Coarse sand & small gravel - water bearing	156	187	31
Grey sand with gray clay binder	187	230	43
Sand - some water	230	234	4
Sand & blue clay	234	246	12
Fine gray sand	246	259	13
Blue clay & sand	259	265	6
Heavy blue shale	265	281	16
Blue clay & sand	281	305	24
Fine sand - scattered gravel	305	352	47
Gray sand & clay	352	361	9
Black shale & sand	361	384	23
Brown clay	384	396	12
Sand stone	396	409	13

STATE ENGINEER
Salem, Oregon

State Well No. 1N/3E-8E(6
County Mult.
Application No. GR 862

Well Log

Owner: Reynolds Metal Co Owner's No. 4-12

Driller: Date Drilled

CHARACTER OF MATERIAL	(Feet below land surface) From	To	Thickness (feet)
Sand & clay	409	418	9
Blue clay & gravel	418	421	3
Hard packed sand & clay	421	426	5
Hard packed sand	426	447	21
Clay & gravel	447	475	28
Sandy clay	475	488	13
~~St~~ sandstone	488	508	20
Sand & gravel, loose - water bearing	508	558	50
Blue clay	558	560	2
Loose sand & gravel - some water	560	578	18
Cemented gravel	578	598	20
Fine blue sand & silt - water	598	607	9
Blue clay - Hard	607	616	9

STATE ENGINEER
Salem, Oregon

MULT

Well Record

001327

STATE WELL NO. 1N/3-23G(7)
COUNTY Multnomah
APPLICATION NO. GR-462

OWNER: Reynolds Metals Co.

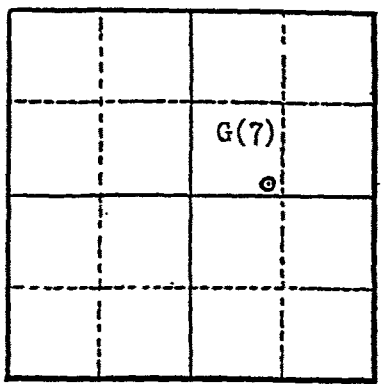
MAILING ADDRESS: Sundial Rd.

CITY AND STATE: Troutdale, Oregon

LOCATION OF WELL: Owner's No. 13

SW ¼ NE ¼ Sec. 23 T. 1 ~~N.~~ N., R. 3 ~~E.~~ W., W.M.

Bearing and distance from section or subdivision corner 2839' N. & 1534' W. from SE cor. sec. 23



Altitude at well 28.5'

TYPE OF WELL: Drilled Date Constructed 9/9/47

Depth drilled 195' Depth cased 195'

Section 23

CASING RECORD:
20 inch from 0 to 140 feet
12 inch from 127 to 195 feet

FINISH:

AQUIFERS:

WATER LEVEL:
105 feet

PUMPING EQUIPMENT: Type Peerless turbine H.P. 40
Capacity 1200 G.P.M.

WELL TESTS:
Drawdown ..... ft. after ..... hours ..... G.P.M
Drawdown ..... ft. after ..... hours ..... G.P.M

USE OF WATER Industrial Temp. ..... °F. ....., 19....
SOURCE OF INFORMATION GR- 445
DRILLER or DIGGER .....
ADDITIONAL DATA:
Log X Water Level Measurements ..... Chemical Analysis ..... Aquifer Test .....

REMARKS:

State Printing 89316

STATE ENGINEER
Salem, Oregon

State Well No. (N3-2E6)
County Mult.
Application No. GR-442

Well Log

Owner: Reynolds ~~Metals~~ Metals Co. Owner's No. #13

Driller: — Date Drilled Sept. 9, '47

CHARACTER OF MATERIAL	(Feet below land surface) From	To	Thickness (feet)
Dredge sand from river	0	4	4
Brown sandy clay	4	16	12
Blue clay	16	20	4
Soft brown sandy clay	20	36	16
Hard brown clay	36	49	13
Fine grey sand	49	140	91
Coarse Gray sand. gray clay binder	140	150	10
Coarse sand, small gravel water bearing formation	150	188	38
Cemented gray sand	188	195	7

STATE ENGINEER
Salem, Oregon

MULT

Well Record

STATE WELL NO. 1N/3-23G(8)
COUNTY Multnomah
APPLICATION NO. GR- 462

001310

OWNER: Reynolds Metals Co.

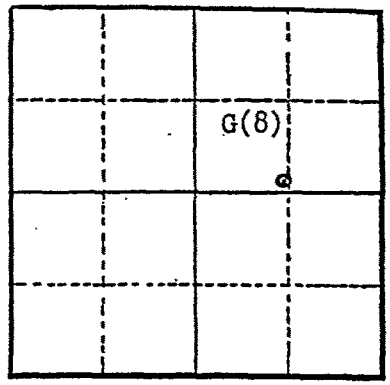
MAILING ADDRESS: Sundial Rd.

CITY AND STATE: Troutdale, Oregon

LOCATION OF WELL: Owner's No. 14

SW ¼ NE ¼ Sec. 23 T. 1 ~~N.~~ S., R. 3 ~~E.~~ W., W.M.

Bearing and distance from section or subdivision corner 2839' N. & 1334' W. from SE cor. sec. 23



Altitude at well 28.5'

TYPE OF WELL: Drilled Date Constructed 9/29/49

Depth drilled 644' Depth cased 644'

Section 23

CASING RECORD:
20 inch from 0 to 144 feet
12 inch from 0 to 644 feet

FINISH:
Perforated from 150 to 189 feet - shut off when well was redrilled to 644 feet. (7/20/55)

AQUIFERS:

WATER LEVEL:
49 feet

PUMPING EQUIPMENT: Type Peerless turbine H.P. 60
Capacity 1180 G.P.M.

WELL TESTS:
Drawdown 100 ft. after hours 1050 G.P.M.
Drawdown ft. after hours G.P.M.

USE OF WATER Industrial Temp. °F., 19
SOURCE OF INFORMATION GR- 445
DRILLER or DIGGER
ADDITIONAL DATA:
Log X Water Level Measurements Chemical Analysis Aquifer Test

REMARKS:

State Printing 89316

STATE ENGINEER
Salem, Oregon

State Well No. 1N/3-23Q(1)
County Mult.
Application No. GP-462

Well Log

Owner: Reynolds Metals Co. Owner's No. #14

Driller: —— Date Drilled Sept. 29, 149

CHARACTER OF MATERIAL	(Feet below land surface) From	To	Thickness (feet)
Dredge sand from river	0	5	5
Brown silt	5	16	11
Brown clay	16	24	8
Runny blue silt	24	35	11
Sticky blue clay	35	42	7
Fine gray sand	42	96	54
Cemented sand & gravel, hard	96	118	22
Hard blue clay	118	124	6
Fine gray sand-gray clay binder	124	146	22
Coarse black sand	146	152	6
Coarse sand, fine gravel-water bearing formation	152	184	32
Fine sand-gray clay binder	184	191	7
Gray silt	191	194	3
Sandy silt	194	215	21
Packed sand	215	224	9
Silt	224	233	9
Sand & clay	233	239	6
Cemented gravel	239	247	8
Sand & gravel w/some clay binder	247	287	40
Packed sand	287	307	20
Gravel & sandy clay	307	332	25

STATE ENGINEER
Salem, Oregon

State Well No. 1N/3-23G(
County Mult.
Application No. GP-962

Well Log

Owner: Reynolds Metals Co. Owner's No. # 14

Driller: ..... Date Drilled —

CHARACTER OF MATERIAL	(Feet below land surface) From	To	Thickness (feet)
Hard packed sand	332	339	7
Sand, some clay & gravel	339	360	21
Sand, clay	360	371	11
Dirty sand, small amount	371	487	116
of gravel			
Cemented gravel	487	495	8
Sand & gravel	495	538	43
Cemented "	538	543	5
Black sand stone	543	551	8
Cemented gravel	551	588	37
Gravel w/ sand silt	588	600	12
Sand & gravel w/ water	600	638	38
Dirty sand	638	649	6

STATE ENGINEER
Salem, Oregon

MULT 001312

Well Record

STATE WELL NO. 1N/3-23H(6)
COUNTY Multnomah
APPLICATION NO. GR- 462

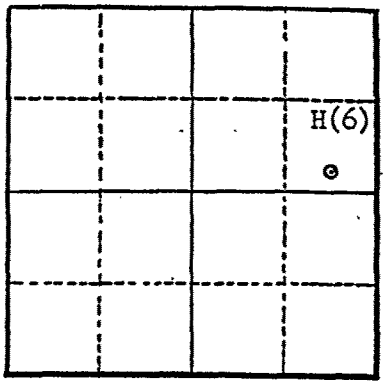
OWNER: Reynolds Metals Co.
MAILING ADDRESS: Sundial Rd.
CITY AND STATE: Troutdale, Oregon

LOCATION OF WELL: Owner's No. 15

SE ¼ NE ¼ Sec. 23 T. 1 N. R. 3 E. W.M.

Bearing and distance from section or subdivision corner 2964' N. & 654' W. from SE cor. sec. 23

Altitude at well 28.5'



TYPE OF WELL: Drilled Date Constructed 4/30/53

Depth drilled 275' Depth cased 275'

Section 23

CASING RECORD:
20 inch from 0 to 242 feet
12 inch from 225 to 275 feet

FINISH:

AQUIFERS:

WATER LEVEL:
41 feet

PUMPING EQUIPMENT: Type F. M., Pamona turbine H.P. 75
Capacity 1200 G.P.M.

WELL TESTS:
Drawdown 51 ft. after hours 1350 G.P.M.
Drawdown ft. after hours G.P.M.

USE OF WATER Industrial Temp. °F., 19
SOURCE OF INFORMATION GR- 445
DRILLER or DIGGER
ADDITIONAL DATA:
Log X Water Level Measurements Chemical Analysis Aquifer Test

REMARKS:

State Printing 89316

STATE ENGINEER
Salem, Oregon

State Well No. 1N/3-23H
County Mult.
Application No. GP-462

Well Log

Owner: Reynolds Metals Co. Owner's No. #15

Driller: Date Drilled April 30, '53

CHARACTER OF MATERIAL	(Feet below land surface) From	To	Thickness (feet)
Dredge sand from river	0	5	5
Sandy clay	5	16	11
Hard packed sand	16	45	29
Silt	45	58	13
Hard packed sand	58	77	19
Sandy silt	77	81	4
Very hard packed sand	81	132	51
Sand & some small gravel	132	172	40
Silt & sand	172	208	36
Hard sand like sandstone	208	211	3
Silt	211	219	8
Gravel w/ clay binder	219	228	9
Sand & clay	228	240	12
Cemented gravel & boulders	240	256	16
Sand w/ water	256	260	4
Gravel w/ some water	260	272	12
Tight gravel	272	275	3

NOTICE TO WATER WELL CONTRACTOR: The original and first copy of this report are to be filed with the STATE ENGINEER, SALEM, OREGON 97310 within 30 days from the date of well completion.

RECEIVED NOV 29 1967 STATE ENGINEER SALEM, OREGON

WATER WELL REPORT

STATE OF OREGON (Please type or print) (Do not write above this line)

MULT

001313

State Well No. 1N/3-23 da

State Permit No. G-3453

G-3761

(1) OWNER:

Name REYNOLDS METALS Co

Address TROUTDALE, ORE. NO. 16

(2) TYPE OF WORK (check):

New Well [X] Deepening [ ] Reconditioning [ ] Abandon [ ]

If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:

Rotary [ ] Driven [ ]
Cable [X] Jetted [ ]
Dug [ ] Bored [ ]

(4) PROPOSED USE (check):

Domestic [ ] Industrial [X] Municipal [ ]
Irrigation [ ] Test Well [ ] Other [ ]

(5) CASING INSTALLED:

Threaded [ ] Welded [X]

12" Diam. from 0 ft. to 279 ft. Gage .330

10" Diam. from 0 ft. to 121 ft. Gage .365

" Diam. from ft. to ft. Gage

PERFORATIONS:

Perforated? [ ] Yes [X] No.

Type of perforator used

Size of perforations in. by in.

perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

(6) SCREENS:

Well screen installed? [X] Yes [ ] No

Manufacturer's Name JOHNSON

Type STAINLESS STEEL Model No. 15 SLOT

Diam. 12 Slot size 15 Set from 151 ft. to 192 ft.

Diam. 12 Slot size 15 Set from 256 ft. to 269 ft.

(8) WATER LEVEL: Completed well.

Static level 16 ft. below land surface Date 10/27/67

Artesian pressure lbs. per square inch Date

(9) WELL TESTS:

Drawdown is amount water level is lowered below static level

Was a pump test made? [X] Yes [ ] No If yes, by whom? STRASSER

545 gal./min. with 11 ft. drawdown after 1 hrs.
820 " 16 " 1 "
" 1080 " 21 " 12 "

Bailer test gal./min. with ft. drawdown after hrs.

Artesian flow g.p.m. Date

Temperature of water 54° Was a chemical analysis made? [ ] Yes [X] No

(10) CONSTRUCTION:

Well seal—Material used CEMENT GROUT

Depth of seal 56 ft.

Diameter of well bore to bottom of seal 20 in.

Were any loose strata cemented off? [ ] Yes [X] No Depth

Was drive shoe used? [X] Yes [ ] No

Did any strata contain unusable water? [ ] Yes [X] No

Type of water? depth of strata

Method of sealing strata off

Was well gravel packed? [ ] Yes [X] No Size of gravel:

Gravel placed from ft. to ft.

(11) LOCATION OF WELL:

County MULT. Driller's well number 4760

SE ¼ SE ¼ Section 23 T. 1N R. 3E W.M.

Bearing and distance from section or subdivision corner

(12) WELL LOG:

Diameter of well below casing BACKFILLED TO 279

Depth drilled 303 ft. Depth of completed well 279 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level as drilling proceeds. Note drilling rates.

MATERIAL	From	To	SWL
TOP SOIL	0	2	
GREY SAND	2	6	
BROWN SAND	6	13	
BLUE SILT	13	17	
GREY SILT	17	52	
MUDDY SAND	52	79	
PACKED SAND	79	102	
GREY SAND SOME GRAVEL	102	147	
WATER BEARING SAND (SOME GRAVEL)	147	191	
FINE SAND AND SILT	191	253	
SAND, SILT AND GRAVEL	253	269	
SILTY CLAY	269	278	
SAND AND SILT	278	290	
SAND, SILT, SOME GRAVEL	290	303	

Work started SEPT 5 19 67 Completed NOV 2 19 67

Date well drilling machine moved off of well NOV 3 19 67

Drilling Machine Operator's Certification:

This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.

[Signed] [signature] (Drilling Machine Operator) Date NOV 28 19 67

Drilling Machine Operator's License No. 54

Water Well Contractor's Certification:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME R.J. STRASSER DRILLING Co (Person, firm or corporation) (Type or print)

Address 8110 SE SUNSET LANE, PORTLAND, ORE.

[Signed] Robert L. Strasser (Water Well Contractor)

Contractor's License No. 10 Date NOV 28 19 67

(USE ADDITIONAL SHEETS IF NECESSARY)

WELL LOG, WELL #16

Well Log: Backfilled to 279 ft. Depth drilled 303 ft. Depth of completed well 279 ft.

Material	From	To
Top Soil	0	2
Grey Sand	2	6
Brown Sand	6	13
Blue Silt	13	17
Grey Silt	17	52
Muddy Sand	52	79
Packed Sand	79	102
Grey Sand, Some Gravel	102	147
Water Bearing Sand (some gravel)	147	191
Fine Sand and Silt	191	253
Sand, Silt and Gravel	253	269
Silty Clay	269	278
Sand and Silt	278	290
Sand, Silt, Some Gravel	290	303

Work started Sept. 5, 1967. Completed Nov. 2, 1967.
Date well drilling machine moved off of well, Nov. 3, 1967.

Johnson screens, stainless steel, 15 slot. 12" dia. 15 slots set from 151' to 192'. 12" dia. 15 slots set from 256' to 269'.

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the STATE ENGINEER, SALEM, OREGON 97310 within 30 days from the date of well completion.

RECEIVED OCT 6 1969 STATE ENGINEER SALEM, OREGON

WATER WELL REPORT
STATE OF OREGON
(Please type or print)
(Do not write above this line)

MULT 001314 State Well No. 11/3-23CC

State Permit No. _____

(1) OWNER:
Name REYNOLDS METALS Co
Address TROUTDALE, ORE. NO. 17

(2) TYPE OF WORK (check):
New Well [X] Deepening [ ] Reconditioning [ ] Abandon [ ]
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary [ ] Driven [ ]
Cable [X] Jetted [ ]
Dug [ ] Bored [ ]

(4) PROPOSED USE (check):
Domestic [ ] Industrial [X] Municipal [ ]
Irrigation [ ] Test Well [ ] Other [ ]

CASING INSTALLED:
Threaded [ ] Welded [X]

20" Diam. from 0 ft. to 63 ft. Gage .375
12" Diam. from 0 ft. to 170 ft. Gage .330
11" Diam. from 207 ft. to 221 ft. Gage .250
11" Diam. from 238 ft. to 280 ft. Gage .250
11" Diam. from 300 ft. to 310 ft. Gage .250

PERFORATIONS:
Perforated? [ ] Yes [X] No.

Type of perforator used
Size of perforations in. by in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

(7) SCREENS:
Well screen installed? [X] Yes [ ] No
Manufacturer's Name U.O.P JOHNSON
Type STAINLESS STEEL Model No.
Diam. 12 Slot size 14 Set from 170 ft. to 207 ft.
Diam. 12 Slot size 14 Set from 221 ft. to 238 ft.
Diam. 12 Slot size 14 Set from 280 ft. to 300 ft.

(8) WATER LEVEL: Completed well.
Static level 20 ft. below land surface Date 8/26/69
Artesian pressure lbs. per square inch Date

(9) WELL TESTS:
Drawdown is amount water level is lowered below static level
Was a pump test made? [X] Yes [ ] No If yes, by whom? STRASSER
Yield: 1090 gal./min. with 25 ft. drawdown after 12 hrs.
" " " "
" " " "
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water 54° Was a chemical analysis made? [ ] Yes [X] No

(10) CONSTRUCTION:
Well seal—Material used CEMENT GROUT
Depth of seal 64 FT ft.
Diameter of well bore to bottom of seal 20 in.
Were any loose strata cemented off? [ ] Yes [X] No Depth
Was a drive shoe used? [X] Yes [ ] No
Did any strata contain unusable water? [ ] Yes [X] No
Type of water? depth of strata
Method of sealing strata off
Was well gravel packed? [ ] Yes [X] No Size of gravel:
ft. to ft.

(11) LOCATION OF WELL:
County MULT Driller's well number 5321
NE ¼ SW ¼ Section 23 T. 1N R. 3E W.M.
Bearing and distance from section or subdivision corner

(12) WELL LOG:
Diameter of well below casing
Depth drilled 310 ft. Depth of completed well 310 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level as drilling proceeds. Note drilling rates.

MATERIAL	From	To	SWL
BROWN SAND	0	22	
FINE BLUE AND GREY SAND	22	43	
LIGHT GREY SAND	43	61	
HARD PACKED GREY SAND	61	64	
GREY SAND AND CLAY	64	73	
HARD PACKED GREY SAND	73	94	
BLUE SAND	94	106	
PACKED GREY SAND	106	148	
GREY AND BROWN SAND	148	160	
WATER BEARING SAND	160	168	
WATER BEARING SAND AND FINE GRAVEL	168	231	
SAND, SOME GRAVEL	231	240	
SAND, SILT, SOME GRAVEL	240	280	
WATER BEARING SAND, SMALL AMOUNT OF GRAVEL	280	310	

Work started JUNE 24 1969 Completed AUG 29 1969
Date well drilling machine moved off of well SEPT 3 1969

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] [signature] (Drilling Machine Operator) Date 10/1, 1969
Drilling Machine Operator's License No. 54

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
NAME R J STRASSER DRILLING Co (Person, firm or corporation) (Type or print)
Address 8110 SE SUNSET LANE PORTLAND OR
[Signed] Robert L Strasser (Water Well Contractor)
Contractor's License No. 10 Date SEPT 24 1969

WELL LOG, WELL #17

Well Log: Depth drilled 310 ft. Depth of completed well 310 ft.

Material	From	To
Brown Sand	0	22
Fine Blue and Grey Sand	22	43
Light Grey Sand	43	61
Hard Packed Grey Sand	61	64
Grey Sand and Clay	64	73
Hard Packed Grey Sand	73	94
Blue Sand	94	106
Packed Grey Sand	106	148
Grey and Brown Sand	148	160
Water Bearing Sand	160	168
Water Bearing Sand and Fine Gravel	168	231
Sand, Some Gravel	231	240
Sand, Silt, Some Gravel	240	280
Water Bearing Sand, Small amount of Gravel	280	310

Work started June 24, 1969. Completed Aug. 29, 1969. Date well drilling machine moved off of well, Sept. 3, 1969.

Johnson screens, stainless steel. 12" dia., 14 slots set from 170' to 207'.
12" dia., 16 slots set from 221' to 238'
12" dia., 16 slots set from 280' to 300'

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the STATE ENGINEER, SALEM, OREGON 97310 within 30 days from the date of well completion.

RECEIVED
JUN 26 1970
STATE ENGINEER
SALEM, OREGON

WATER WELL REPORT MULT

STATE OF OREGON
(Please type or print) Do not write above this line.
001315

State Well No. 1N/3-23bd
State Permit No. (WELL NO 18)

(1) OWNER:
Name REYNOLDS METALS CO
Address TROUTDALE, ORE.

(2) TYPE OF WORK (check):
New Well [X] Deepening [ ] Reconditioning [ ] Abandon [ ]
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary [ ] Driven [ ]
Cable [X] Jetted [ ]
[ ] Bored [ ]

(4) PROPOSED USE (check):
Domestic [ ] Industrial [X] Municipal [ ]
Irrigation [ ] Test Well [ ] Other [ ]

(5) CASING INSTALLED:
Threaded [ ] Welded [X]
12" Diam. from 0 ft. to 146 ft. Gage .330
11" Diam. from 138 ft. to 148 ft. Gage .250
11" Diam. from 189 ft. to 229 ft. Gage .250
11" Diam. from 260 ft. to 270 ft. Gage .250

(6) PERFORATIONS:
Perforated? [ ] Yes [X] No
Type of perforator used
Size of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

SCREENS:
Well screen installed? [X] Yes [ ] No
Manufacturer's Name U.O.P. JOHNSON
Type STAINLESS STEEL Model No.
Diam. 12 Slot size 15 Set from 148 ft. to 189 ft.
Diam. 12 Slot size 15 Set from 229 ft. to 260 ft.

(8) WATER LEVEL: Completed well.
ic level 14 ft. below land surface Date 6/8/70
Artesian pressure lbs. per square inch Date

(9) WELL TESTS:
Drawdown is amount water level is lowered below static level
Was a pump test made? [X] Yes [ ] No If yes, by whom? STRASSER
1090 gal./min. with 35 ft. drawdown after 1 hrs.
800 " 26 " 1½ "
545 " 17 " 1½ "
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water 54° Was a chemical analysis made? [ ] Yes [X] No

(10) CONSTRUCTION:
Well seal—Material used 80 SKS CEMENT GROUT
Depth of seal 120 FT AND 20 FT ft.
Diameter of well bore to bottom of seal 16 AND 20 in.
Were any loose strata cemented off? [ ] Yes [X] No Depth
" a drive shoe used? [X] Yes [ ] No
any strata contain unusable water? [ ] Yes [X] No
Type of water? depth of strata
Method of sealing strata off
Was well gravel packed? [ ] Yes [X] No Size of gravel:
Gravel placed from ft. to ft.

(11) LOCATION OF WELL:
County MULT Driller's well number 5245
SE ¼ NW ¼ Section 23 T. 1N R. 3E W.M.
Bearing and distance from section or subdivision corner

(12) WELL LOG:
Diameter of well below casing BACKFILLED
Depth drilled 300 ft. Depth of completed well 270 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level as drilling proceeds. Note drilling rates.

MATERIAL	From	To	SWL
BROWN SAND	0	8	
SAND AND SILT	8	100	
SAND, SOME GRAVEL	100	150	
WATER BEARING SAND	150	180	
SAND, SOME GRAVEL	180	190	
SAND AND SILT	190	230	
SAND AND GRAVEL	230	260	
PACKED SANDY SILT	260	300	

Work started APR 20 1970 Completed JUNE 11 1970
Date well drilling machine moved off of well JUNE 11 1970

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] W.M. Johnson (Drilling Machine Operator) Date 6/25, 1970
Drilling Machine Operator's License No. 56

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
NAME R.J. STRASSER DRILLING CO (Person, firm or corporation) (Type or print)
Address 8110 SE SUNSET LANE PORTLAND ORE
[Signed] Robert L. Strasser (Water Well Contractor)
Contractor's License No. 10 Date JUNE 25, 1970

(USE ADDITIONAL SHEETS IF NECESSARY)

WELL LOG, WELL #18

Well Log: Depth drilled 300 ft. Depth of completed well 270 ft.

Material	From	To
Brown Sand	0	8
Sand and Silt	8	100
Sane, Some Gravel	100	150
Water Bearing Sand	150	180
Sand, Some Gravel	180	190
Sand and Silt	190	230
Sand and Gravel	230	260
Packed Sandy Silt	260	300

Work started April 20, 1970. Completed June 11, 1970.
Date well drilling machine moved off of well June 11, 1970.

Johnson Screens, stainless steel. 12" dia. 15 slots set from 148' to 189 ' and from 229' to 260'.

Offsite Wells:
Fairview Farms
Sundial Marine
and
Gresham Sand and Gravel

STATE ENGINEER
Salem, Oregon

MULT 001306 Well Record

GR- 1589

STATE WELL NO. 1N/3-22E
COUNTY Multnomah
APPLICATION NO. GR- 1443

OWNER: (b) (6)

MAILING ADDRESS: (b) (6)

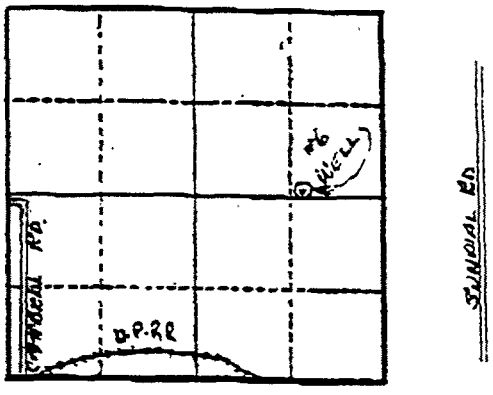
CITY AND STATE: (b) (6)

LOCATION OF WELL: Owner's No. #6

SE ¼ NE ¼ Sec. 22 T. 1 N. R. 3 E. W.M.

Bearing and distance from section or subdivision corner For location see sketch on map

Altitude at well 26'



Section 22

TYPE OF WELL: Drilled Date Constructed 1950

Depth drilled 200' Depth cased 200'

CASING RECORD:
18" from 0 to 140 ft.
12" from 119 to 200 ft.

FINISH:
Perforated from 119 to 200 ft.

AQUIFERS:

WATER LEVEL:
17'

PUMPING EQUIPMENT: Type Peerless turbine H.P. 75
Capacity 1200 G.P.M.

WELL TESTS:
Drawdown 12 ft. after hours 1200 G.P.M.
Drawdown 14 ft. after hours 1500 G.P.M.

USE OF WATER Dom., Irrigation & Manuf. Temp. °F., 19
SOURCE OF INFORMATION GR Record
DRILLER or DIGGER
ADDITIONAL DATA:
Log ✓ Water Level Measurements Chemical Analysis Aquifer Test

REMARKS: Irrigation of 170 acres.

Log:

Top soil & yellow clay	0 to 16 ft.
Yellow sand	16 to 27 ft.
Blue quicksand	27 to 49 ft.
Fine gray sand	49 to 82 ft.
Brown silt	82 to 94 ft.
Fine gray sand - gray clay binder	94 to 136 ft.
Coarse sand - small gravel - gray clay binder	136 to 158 ft.
Coarse sand - small gravel - water bearing	158 to 182 ft.

COLUMBIA RIVER SANDS AQUIFER

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the
WATER RESOURCES DEPARTMENT.
SALEM, OREGON 97310
within 30 days from the date of well completion.

WATER WELL REPORT
STATE OF OREGON MULT
(Please type or print)
(Do not write above this line) 061251

State Well No. 1N/3E-14 CB 1/4-1/4
State Permit No.

(1) OWNER:
Name (b) (6)
Address

(2) TYPE OF WORK (check):
New Well ☒ Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary ☒ Driven ☐
Cable ☐ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(5) CASING INSTALLED:
Threaded ☐ Welded ☒
6 " Diam. from 0 ft. to 227 ft. Gage .250
5 " Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

(6) PERFORATIONS:
Perforated? ☐ Yes ☒ No
Type of perforator used
Size of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

(7) SCREENS:
Well screen installed? ☒ Yes ☐ No
Manufacturer's Name JOP Johnson
Type stainless Model No.
Diam. 6 Slot size 15 Set from 228 ft. to 238 ft.
Diam. Slot size Set from ft. to ft.

(8) WELL TESTS:
Drawdown is amount water level is lowered below static level
Was a pump test made? ☐ Yes ☒ No If yes, by whom?
60 gal./min. with 0 ft. drawdown after hrs.
Baller test 60 gal./min. with 0 ft. drawdown after 1 hrs.
Artesian flow g.p.m.
Temperature of water Depth artesian flow encountered ft.

(9) CONSTRUCTION:
Well seal—Material used cement
Well sealed from land surface to 20 ft.
Diameter of well bore to bottom of seal 10 in.
Diameter of well bore below seal 6 in.
How many sacks of cement used in well seal 9 sacks
How was cement grout placed? pumped
Was drive shoe used? ☒ Yes ☐ No Plugs Size: location ft.
Did any strata contain unusable water? ☐ Yes ☒ No
Type of water? depth of strata
Method of sealing strata off
Was well gravel packed? ☐ Yes ☒ No Size of gravel:

(10) LOCATION OF WELL:
County Multnomah Driller's well number
SW ¼ SW ¼ Section 14 T. 1N R. 3E W.M.
Bearing and distance from section or subdivision corner

(11) WATER LEVEL: Completed well.
Depth at which water was first found 30 ft.
Static level 25 ft. below land surface. Date 12-19-79
Artesian pressure lbs. per square inch. Date

(12) WELL LOG:
Diameter of well below casing 6
Depth drilled 238 ft. Depth of completed well 238 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
mucky sand	0	16	
mucky sand & clay	16	30	
sand, water	30	85	
sand, wood, water	85	100	
sand	100	135	
sand, water	135	180	
sand & water some silt	180	222	25
sand & gravel water	222	238	

RECEIVED
1979
WATER RESOURCES DEPT

Work started 12-14 19 79 Completed 12-19 1979
Date well drilling machine moved off of well 12-19- 19 79

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] Jim D Hansen (Drilling Machine Operator) Date 12-20, 1979
Drilling Machine Operator's License No. 841

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Name Hansen Drilling Co., Inc. (Person, firm or corporation) (Type or print)
Address 6711 NE 58th Ave. Vancouver, WA.
[Signed] Marvin Semple (Water Well Contractor)

AUG 30 '94 8:11 FROM E AND E SEATTLE

Current owner:
Gresham Sand and Gravel Co.

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the STATE ENGINEER, SALEM, OREGON 97310 within 30 days from the date of well completion.

WATER WELL REPORT
STATE OF OREGON
(Please type or print)
(Do not write above this line)

State Well No. 1N/3-14
State Permit No. MULT 001252

(1) OWNER:
Name (b) (6)
Address

(2) TYPE OF WORK (check):
New Well ☑ Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary ☐ Driven ☐
Cable ☑ Jetted ☐
Bored ☐

(4) PROPOSED USE (check):
Domestic ☑ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(5) CASING INSTALLED: Threaded ☐ Welded ☑
6" Diam. from 0 ft. to 127 ft. Gage 250
6" Diam. from 0 ft. to 120 ft. Gage 250
" Diam. from ft. to ft. Gage

PERFORATIONS: Perforated? ☐ Yes ☑ No
Type of perforator used
Size of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

(7) SCREENS: Well screen installed? ☑ Yes ☐ No
Manufacturer's Name Johnson
Type Steeled Model No.
Diam. 6 in. Slot size 15 Set from 125 ft. to 130 ft.
Diam. 6 in. Slot size 10 Set from 120 ft. to 125 ft.

(8) WATER LEVEL: Completed well.
Static level 30 ft. below land surface Date Nov 10
Artesian pressure lbs. per square inch Date

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? ☐ Yes ☐ No If yes, by whom?
gal./min. with ft. drawdown after hrs.
Bailer test 60 gal./min. with 4 ft. drawdown after 2 hrs.
Artesian flow g.p.m. Date
Temperature of water 52 Was a chemical analysis made? ☐ Yes ☐ No

(10) CONSTRUCTION:
Well seal—Material used Bentonite
Depth of seal 19 ft.
Diameter of well bore to bottom of seal 10 in.
Were any loose strata cemented off? ☐ Yes ☐ No Depth
Was a drive shoe used? ☑ Yes ☐ No
Did any strata contain unusable water? ☐ Yes ☑ No
Type of water? depth of strata
Method of sealing strata off
Was well gravel packed? ☐ Yes ☑ No Size of gravel:

(11) LOCATION OF WELL:
County Multnomah Driller's well number 967-47
¼ ¼ Section 14 T. 1N R. 3E W.M.
Bearing and distance from section or subdivision corner

(12) WELL LOG: Diameter of well below casing 6
Depth drilled 127 ft. Depth of completed well 127 ft.
Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level as drilling proceeds. Note drilling rates.

MATERIAL	From	To	SWL
SAND FINE BLACK	0	57	
SAND FINE GRAY WATER	57	120	57
SAND FINE WITH GRAVEL MEDIUM WATER BEARING	120	122	
SAND FINE GRAY BLACK WATER BEARING	122	130	

Work started Oct 26 1967 Completed Nov 10 1967
Date well drilling machine moved off of well Nov 10 1967

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] Kenneth Skinner Date Nov 16, 1967
(Drilling Machine Operator)
Drilling Machine Operator's License No. 277

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
NAME Skyles Drilling & Supply
(Person, firm or corporation) (Type or print)
Address Gladstone, Oregon
[Signed] George A. Skyles
(Water Well Contractor)

Appendix F

Quality Assurance Sampling Plan

OU1 Quality Assurance Sampling Plan for: Reynolds Metals Facility Troutdale, Oregon

1.0 Background

The Reynolds Metals Facility is a primary aluminum reduction plant that has operated on an 80-acre site outside Troutdale, Oregon since 1942. To address the complex nature of this site with multiple production processes, waste streams, and disposal practices, the site has been divided into operable units (OUs) based on media, waste source type, and site geographical location. OU 1 encompasses the south and east potliner disposal areas, the cryolite pond, the facility scrapyard, the wetlands area, the north industrial landfill, and the parking lot. The media of concern include surface soil, subsurface soil, surface water, sediment, and groundwater.

The types of activities at this site that contributed to the wastes of concern to the Environmental Protection Agency's (EPA's) on-scene coordinator (OSC) include: reduction of alumina to aluminum metal and associated production processes; onsite disposal of potliners (carbon-lined reduction cells, a listed hazardous waste with waste identification number K088) and other production waste streams; the alleged use of potliners as a fill material in the construction of the facility parking lot; the alleged storage/disposal of polychlorinated biphenyl (PCB)-contaminated debris in the potliner disposal area; the recovery of cryolite in the cryolite recovery pond; and the release of free elemental mercury and other potentially hazardous substances from facility equipment discarded at the onsite scrapyard.

The major soil contaminants identified in Reynolds Metals facility soil and summarized in the Site Inspection Prioritization (SIP) report (PRC 1993) are listed in Table 1. The concentrations are of concern because they are elevated above background sample levels and/or risk-based concentrations established by the State of Oregon and EPA (E & E 1994). PCBs are also a contaminant of concern based on extensive historical use of

electrical equipment that contains PCB oils. Although in a previous investigation different media were sampled for PCBs, all of the analytical data were rejected because of organic interferences, hence, there is no PCB information available for the site.

Table 1
Constituents and Concentrations of Concern in Soil

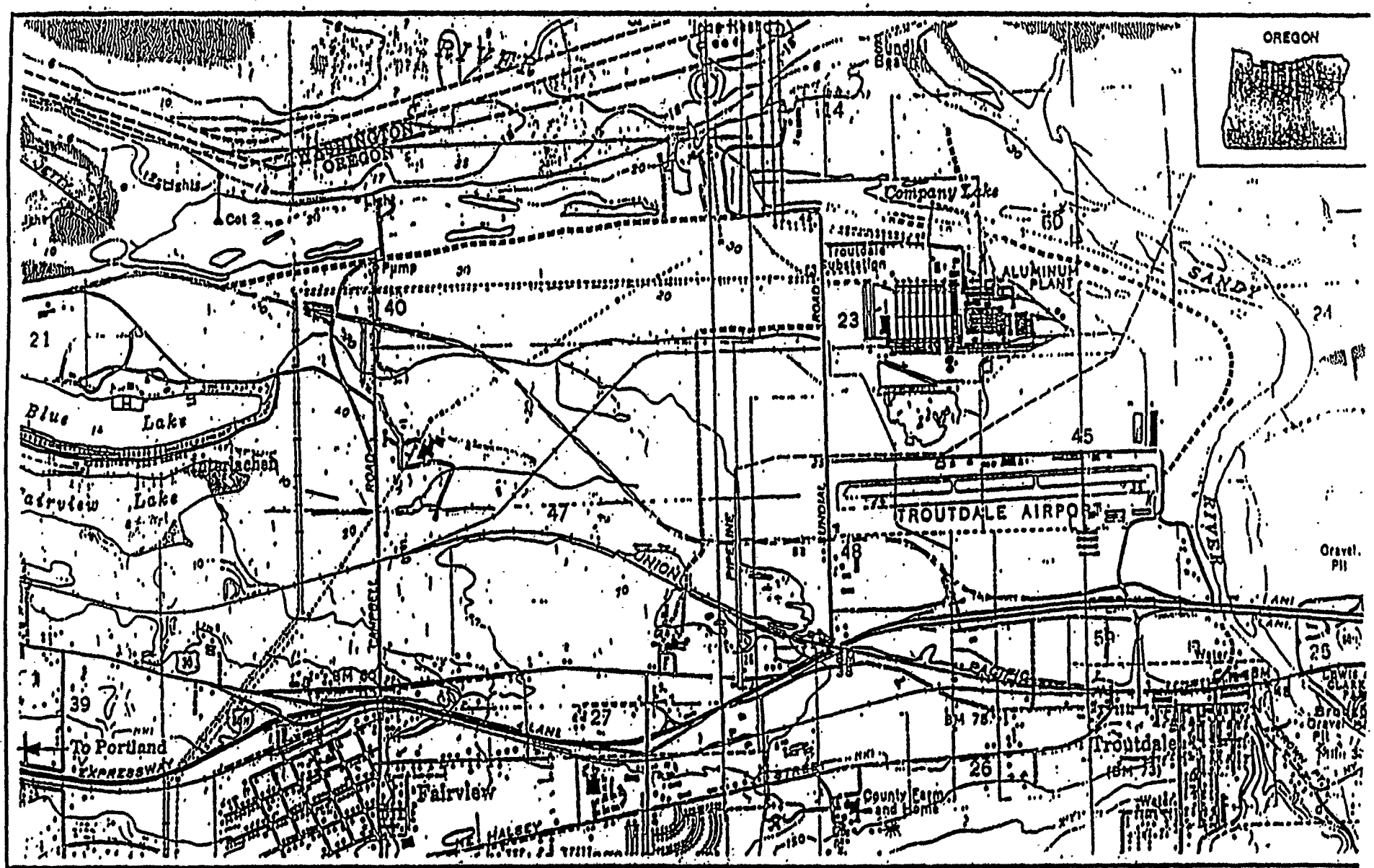
Constituent	Concentration (mg/kg)
Total polynuclear aromatic hydrocarbons	4,071
Aluminum	322,000
Copper	8,770
Cyanide	57.6
Fluoride	137,000

Notes
1. Data from the SIP Report (PRC 1993)
2. mg/kg = milligrams per kilogram

The site is located north of the City of Troutdale, in Multnomah County, Oregon (see Figure 1). The nearest residences are located 0.5 mile to the south. Significant environments in the proximity of the site include wetlands located directly adjacent to the south side of the facility and Company Lake with associated wetlands directly north of the facility. Other significant environments include the Sandy River 0.25 mile east of the facility and the Columbia River 0.75 mile to the north.

2.0 Project Objectives

As this site may pose an imminent and substantial threat to public health and/or the environment, time considerations are a significant factor in the design and execution of this plan. The objectives of the proposed field activities are to:



ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington.

REYNOLDS METALS COMPANY
Troutdale, Oregon

BASE MAP REFERENCE:
USGS 7.5 Quad, Camas, Washington 1978
Scale 1:24,000

Figure 1
SITE LOCATION MAP

Drawn By:	Date:	TDD/Job No.	Dwg. No.
AES	3-1-84	T10-8311-006	1881LM

1. Determine if potliners and other wastes are present in the south or east potliner disposal area, the cryolite pond, beneath the parking lot, in the north industrial landfill, or in the south wetlands.

2. If potliners are found, perform an extent of contamination (EOC) in the vertical and horizontal directions. If potliners are not found, perform a limited EOC survey of contaminated soil in the south and east potliner disposal areas, the cryolite pond, and in the parking lot.

3. Design and install a groundwater monitoring well network and sampling program to determine depth to groundwater, hydraulic gradient, and extent of shallow groundwater contamination, if present, attributable to past practices related to potliner disposal or other sources.

4. Conduct an EOC survey of contaminated surface and subsurface soil in the scrapyard area.

5. Conduct a reconnaissance of the floodplain area (between the Sandy and the Columbia Rivers) and other target areas. Document suspicious stains, ground surface features and disturbances and collect grab samples as needed.

6. Collect groundwater samples from existing onsite production wells for water quality analysis. Perform quality assurance (QA) level 3 analysis on Reynolds' production well number 18 (PW-18) to establish level of confidence in deep groundwater quality data.

7. Collect sediment samples from Company Lake near the refractory brick debris pile on the Corps of Engineers (COE) dike to check for indications that PCBs may have leaked from capacitors alleged to have been buried in

the dike. If feasible, conduct a surface geophysical survey in selected areas in an attempt to locate the site where capacitors were allegedly disposed.

8. Collect sediment/surface water samples from the Company Lake outflow to the Columbia River to determine if contaminants related to site operations are present.

The data will be screened against EPA Region 10 Supplemental Risk Assessment Guidance for Superfund Criteria; EPA Safe Drinking Water Act National Primary and Secondary Drinking Water Regulations; EPA Region 3 Risk-Based Concentration Table Values; Oregon Department of Environmental Quality (DEQ) Environmental Cleanup Rules; Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario; State of Wisconsin Guidelines for Maximum Allowable Concentrations of Contaminants in Great Lake Sediments; and EPA Federal Water Quality Criteria for Surface Waters; although these criteria ultimately may or may not be applicable or appropriate for setting cleanup criteria for affected media at this site.

3.0 Quality Assurance Objectives

In accordance with the objectives outlined in Section 2.0, and the QA levels defined by the EPA (EPA 1990c), the sampling and analyses performed under this sampling effort will conform to the use and QA criteria summarized in Table 2.

Table 2 Data Use and Quality Assurance Objectives			
Parameter	**Matrix**	**Intended Data Use**	**QA Objectives**
Cyanide	Soil, air, sediment, water	Assessment, EOC, risk determination	QA 2
TPAH	Soil, air, sediment, water	Assessment, EOC, risk determination	QA 2
Metals	same	same	QA 2
Fluoride	same	same	QA 2
PCBs	same	same	QA 2
Cyanide, metals	1 PW water	Bias, level of confidence in laboratory's performance	QA 3

4.0 Methodologies

4.1 Samples

All samples will be collected, identified, and handled, and all documentation and chain of custody procedures will be conducted in accordance with Region 10 Removal Program guidelines and protocols. The QA Level 2 and 3 QA Requirements and QA 2 Validation Requirements will be as mandated by EPA guidelines (EPA 1990c). Other operating procedures that will be used in this sampling effort are generally consistent with those described in Appendix B of the Technical Assistance Team's Sampling Plan for the Reynolds Metals Troutdale Facility (E&E 1994). These include:

Field Logbook
Sample Equipment Decontamination
Soil Sampling
Monitoring Well Installation
Well Development
Water Level Measurement
Groundwater Well Sampling
Potable Water Sampling
Geoprobe Large Bore Sampler SOP
Sample Documentation
Waste Pile Sampling
Surface Water Sampling
Sediment Sampling
General Air Sampling Guidelines
Immunoassay Field Screening QA/QC
GPS Draft SOP–under development

The equipment listed in Table 3 will be used to obtain samples during the course of this project.

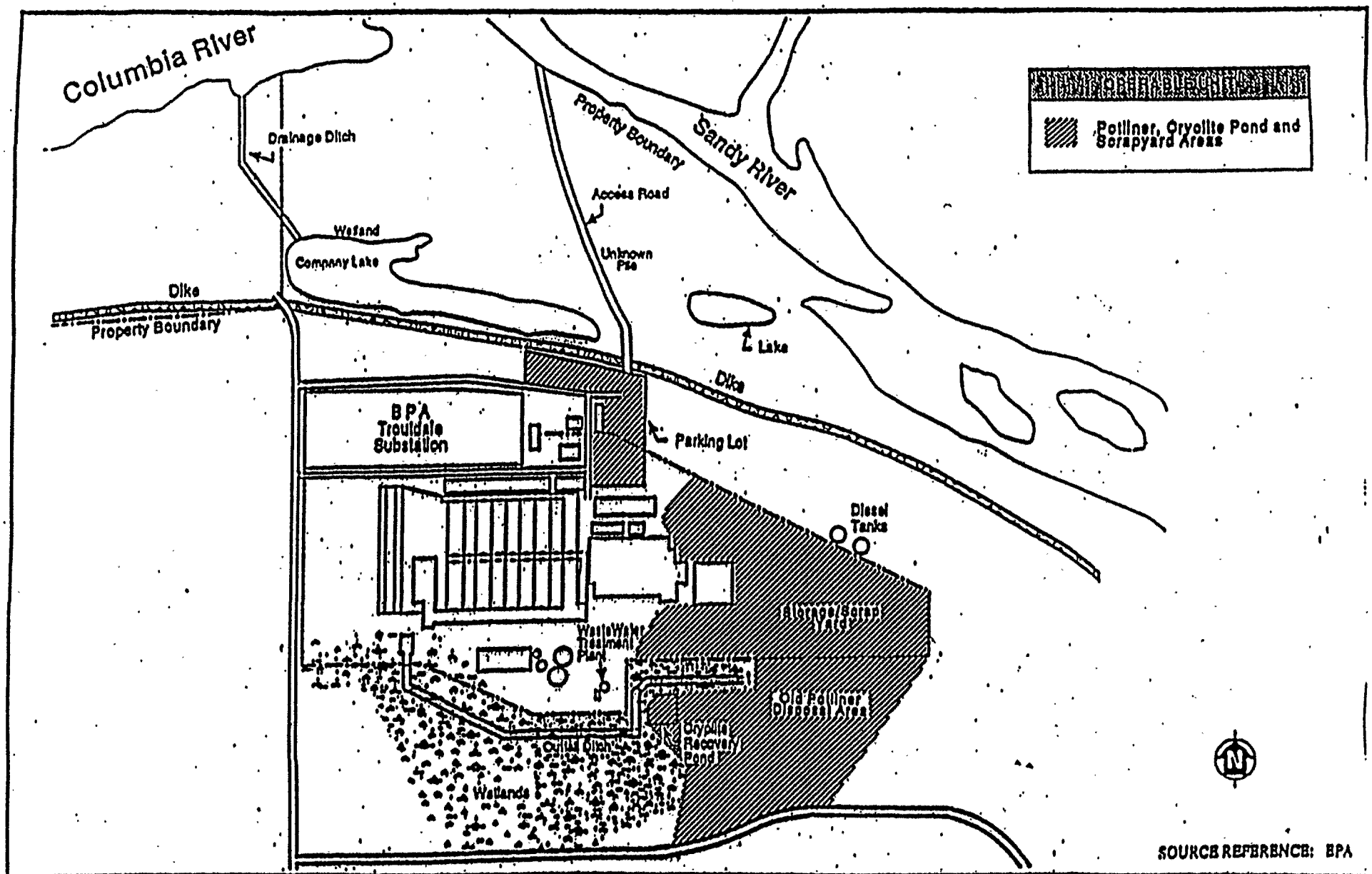
Table 3 Sampling Equipment Description			
Matrix	**Sampling Equipment**	**Fabrication**	**Dedicated**
Soil	Geoprobe Large Bore Sampler with acetate liner Split-spoon sampler Bowls and spoons Sample Containers	Steel Plastic Steel Stainless Steel Glass	No Yes No Yes Yes
Sediment	Ekman Dredge (or equivalent) Bowls and Spoons Sample Containers	Steel Stainless Steel Glass	No Yes Yes
Groundwater	Teflon Bailers Submersible pump Sample Containers	Teflon plastic Stainless Steel Glass/Plastic	No No Yes
Surface water	Sample Containers	Glass/Plastic	Yes
Ambient air (as needed)	HIVOL Air Samplers PUFS filters Filter Papers	Aluminum Polyurethane Foam Quartz Microfibre Cellulose Acetate	No Yes Yes Yes

4.2 Sampling Rationale

The anticipated assessment areas for OU 1 are outlined on Figure 2. Several additional areas have been identified through the initial reconnaissance that will be investigated in addition to the areas shown on Figure 2. These areas are

- The eastern potliner disposal area
- The south wetlands
- The industrial landfill
- The small cryolite ponds

The sampling and analysis strategy is based on the following rationale.



ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

REYNOLDS METAL COMPANY
Troutdale, Oregon

Figure 2
OPERABLE UNIT ASSESSMENT AREA

800' 0 800' 600' Approximate Scale in Feet	Drawn By	Date	TDD/Job No.	Dwg. No.
	AES	9-1-84	T10-8311-008	1071SM

General

This section describes the sampling and exploration areas for the Phase 2 soil sampling effort. Soil sampling with backhoe and hand auger will commence the week of July 17 with one crew. Soil exploration with geoprobe will commence the week of July 25. If potliners are identified and initial screening indicates that surface geophysical techniques may be helpful in mapping the extent any identified potliner, as discussed below, the geophysical survey will commence as soon as schedule permits, either the week of August 15 or August 22.

Geophysical methods will be considered for use in mapping the vertical and horizontal extent of the suspected potliner disposal areas. The method which would be used is electromagnetics, using the EM-61, which can detect contrasts in soil or medium conductivity at depths up to about 15 feet. Verification sampling would be performed using hand sampling and geoprobe sampling as discussed below.

Geophysical methods will also be considered for use in attempting to locate the allegedly buried capacitors. A magnetometer will be evaluated for use in scanning the dike adjacent to the COE dike, the north industrial landfill, the north parking lot, and the clearing in the woods near the plant outfall which was noted in aerial photographs. The method may not be effective when in the proximity of the BPA power lines.

In general, soil sampling will be performed either with stainless steel spoons, acetate lined Geoprobe sleeves or stainless steel hand auger. Spoons will be discarded after each sample is taken. A new (dedicated) sleeve will be used for each geoprobe sample, and the geoprobe probe, auger and backhoe bucket will be decontaminated between sampling events or test holes. Where possible, the backhoe bucket and/or auger flight will be decontaminated by pressure washing into the backhoe pit or auger excavation.

For the initial sampling effort, samples will be taken at the intervals discussed below for the various areas. Samples will be composited vertically, where indicated, and discrete samples will also be collected. Based on the initial sample results, additional testing of discrete samples will be conducted. The purpose of compositing the samples is to perform a broad survey to determine the horizontal distribution of the various constituents. If constituents of concern for the Reynolds Metals facility are found in specific areas, discrete samples may be tested to determine the vertical distribution of the constituents.

Test pits will be backfilled with the excavated soil after sampling is completed.

Approximately 10 percent of the screened samples (PCB and TPAH) will be tested by rigorous methods in the laboratory. A complete list of proposed laboratory tests including methods and numbers of tests will be developed as the project progresses.

This document is intended to be a planning tool, and as such, may be revised as the project progresses and as actual conditions are uncovered in the field. For example, if it is not possible to penetrate the potliner area with the geoprobe, it may be better to perform additional exploration with the backhoe. Similarly, if geophysics are not appropriate for exploration of the potliner disposal area, more backhoe pits may be employed to help determine the lateral and vertical EOC.

Potliner Disposal Area

The rationale for exploring and sampling in this area is to determine the lateral and vertical extent of any remnant potliner and any remnant contamination.

Initial exploration:

- Dig 11 test pits to native ground (if possible), or to 7.5 feet, or to the groundwater table.
- Sample at surface, 2.5 feet, 5 feet, and 7.5 feet.
- Identify potliner visually and confirm with limited laboratory analytical.
- Soil samples will be screened in the laboratory for TPAH, cyanide, and fluoride.
- Selected soil samples will be screened for 13 metals and PCBs.

If potliners are found:

- Screen potliner matrix and native soil for electrical resistivity using conventional hand-held soil resistivity gear.
- If contrast in resistance between potliner matrix and native soil is adequate, plan to determine lateral and vertical extent of contamination with geophysical methods (EM).
- Do confirmation borings with Geoprobe. Estimate four Geoprobe holes to a depth of 10 feet, or to the groundwater table. Sample continuously and test 0-2 foot interval, 2-4 foot interval, 4-6 foot, etc.

If potliners are not found:

- Do confirmation borings with Geoprobe. Do 8 probes to maximum depth of 10 feet, or to groundwater table. Sample continuously and test as above.

Cryolite Pond and Small Cryolite Ponds

The rationale for sampling in the cryolite pond area is to determine the lateral and vertical EOC and potential migration patterns. The following work will be conducted:

- Drill two test holes in the main cryolite pond using a power auger.
- Drill one test hole in each of two smaller ponds using a hand auger.
- Drill two test holes in native ground adjacent to the main cryolite pond using a hand auger.
- Take samples at the surface, 2.5-foot depth and the 5-foot depth.
- Perform laboratory screening on composite samples for TPAH, cyanide and PCB. Perform laboratory testing for fluoride and 13 metals from discrete samples from native soil (if encountered).
- Make visual estimate of the horizontal extent of cryolite and measure using survey techniques.

Parking Lot

The rationale for sampling in the parking lot is to investigate past allegations that potliners may have been used as fill for the parking lot. The following work will be conducted:

- Perform four test probes using the Geoprobe in the parking lot area to a maximum depth of 7 feet (or to groundwater).
- Take samples from the following depth intervals: 1-3 feet, 3-5 feet, and 5-7 feet.
- Perform laboratory screening tests on discrete samples for TPAH, cyanide, and fluoride.
- Based on the laboratory results, if potliners are indicated, plan additional Geoprobe holes to determine the horizontal and vertical EOC.

Scrapyard

The SIP sampling showed elevated concentrations of TPAH and metals. The rationale for the sampling will be to determine the vertical and horizontal extent of contamination.

- Perform up to 15 backhoe test pits in the scrapyard.
- Take samples from 0-2 foot interval and 2-4 foot.
- Perform laboratory screening on composite samples for TPAH, cyanide, fluoride and PCBs.

- Perform laboratory screening for 13 metals on selected samples, primarily in the area where mercury was cleaned up in 1993.

Eastern Potliner Area

During the groundwater investigations, suspected potliner was discovered at the eastern end of the site. The purpose of investigating in this area is to determine the lateral and vertical EOC.

- Excavate 8 test pits in the area to a depth of 4 feet or to the groundwater table.

- Take samples at surface, 2-, and 4-foot depths.

- Perform laboratory screening on composite soil samples for TPAH, cyanide and fluoride.

- Perform laboratory screening for PCBs and 13 metals on selected samples if the area appears to be a scrapyard.

- If buried potliner is discovered, geophysical methods will be considered similar to those discussed above to determine the lateral and vertical EOC.

- Based on the field investigations and laboratory analysis, plan additional Geoprobe holes or test pits to confirm lateral and vertical EOC.

South Wetlands

No samples were taken in the south wetlands area during the SIP. Early aerial photographs indicate that the wetlands area served as a process water discharge pond

during the early years of the plant operation. The rationale for sampling in the wetlands is to determine whether contamination is present (incidence of contamination, or IOC).

- Perform 5 hand auger borings to depth of 3 feet.
- Take samples at surface and at the 3-foot depth.
- Perform laboratory screening on composited samples for TPAH, PCB, cyanide, fluoride, 13 metals, TPH and pesticides.
- Based on the field investigations and laboratory analysis, plan additional field investigations to determine lateral and vertical EOC.

North Industrial Landfill

Sampling and analysis performed by CH2M HILL in June 1994 in the industrial landfill east of the road showed elevated levels of PAH and PCB, as well as some asbestos. The rationale for sampling west of the road is to determine the relative concentration of constituents in the landfill.

- Perform eight test pits up to 12 feet deep (to groundwater or to native ground).
- Take up to three samples per test pit.
- Perform laboratory screening on composite samples for TPAH, PCB, 13 metals, cyanide, fluoride, and asbestos (if indicated).
- Visually determine horizontal extent of landfill and measure using survey techniques.

Miscellaneous Sampling Areas

Several additional disturbed areas were noted during initial site reconnaissance activities and were sampled. These areas were:

- The stressed-vegetation area south and west of the south potliner area. Surface samples were taken from this area and tested for cyanide, fluoride, PCBs, 13 priority pollutant metals and TPAH.

- The sand preload area southwest of Potline 5 was sampled and tested for cyanide, fluoride, PCBs and TPAH.

Groundwater

Past Work. Detectable concentrations of cyanide and fluoride were detected in groundwater samples collected by PRC from the onsite deep production wells (PRC 1993). These onsite wells supply the facility with process and drinking water.

A total of eight shallow groundwater monitoring wells were installed by Reynolds Metals during the Phase 1 groundwater investigation using hollow stem auger drilling techniques. Monitoring well locations are shown on Figure 3. Monitoring wells were either two or four inches in diameter, depending on the potential for future use as extraction wells, should groundwater remediation be required. The locations of the shallow monitoring were mutually agreed to by Reynolds Metals and EPA on the basis of available information regarding past practices at the Troutdale facility.

A water level monitoring program was initiated soon after well installation by installing data loggers and transducers in the Columbia River and in MW-8, -6, and -5. This

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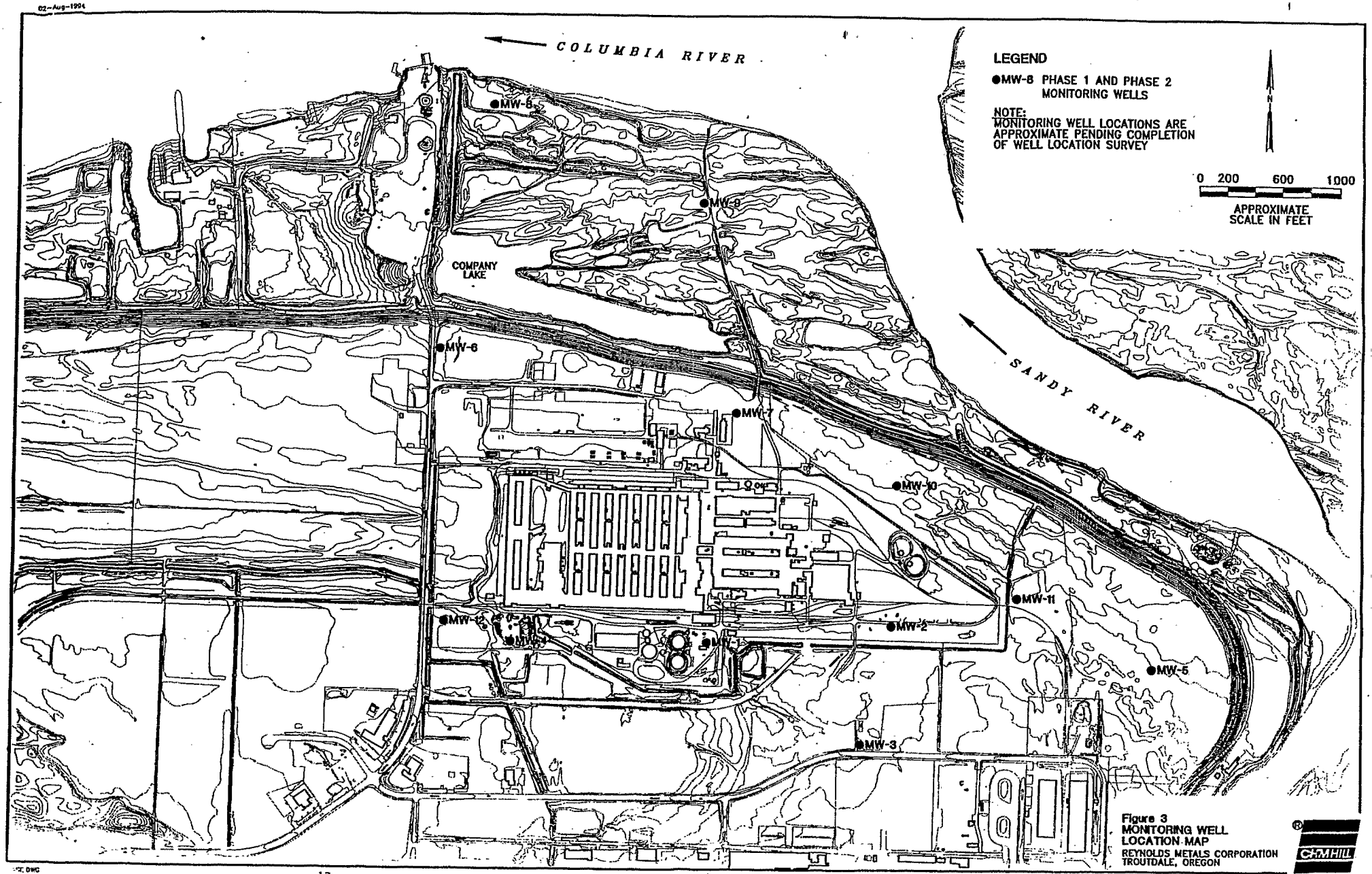

Figure 3
MONITORING WELL LOCATION MAP
REYNOLDS METALS CORPORATION
TROUTDALE, OREGON

CH2MHILL

.DWG

network of continuous groundwater level monitoring will be supplemented by periodic manual measurements in other monitoring wells at the facility. To improve the understanding of groundwater hydraulics at the facility, the data logger network may be adjusted by moving the transducers and loggers to alternative wells.

Ongoing and Future Work. The eight shallow monitoring wells were sampled and samples analyzed during the week of July 18, 1994. After the data from this sampling round has been evaluated, Reynolds Metals will meet with EPA to discuss the results of the sampling event and the results of the water level monitoring program. The need for and location of any additional monitoring wells will be established at that time. If indicated by the data collected during Phase 1 or other information regarding past practices at the Troutdale facility, additional monitoring wells will be installed using similar techniques as used for Phase 1 monitoring wells. After their installation, Phase 2 monitoring wells, selected Phase 1 monitoring wells, and selected production wells will be sampled and the samples analyzed for a list of constituents agreed upon by Reynolds Metals and EPA.

The scope of any ongoing, periodic groundwater monitoring program for the facility will be determined as indicated on the basis of the results of sampling and analysis conducted during the Phase 1 and Phase 2 monitoring well installation programs.

Sample Analysis. Groundwater samples collected by CH2M HILL for Reynolds Metals will be analyzed in the laboratory for total petroleum hydrocarbons (TPH), volatile organic compounds (VOC), semivolatile organic compounds, plus polynuclear aromatic hydrocarbons (PAH), PCBs, pesticides, total cyanide (supplemented by a free cyanide analysis if total cyanide analysis yields detectable concentrations of cyanide), fluoride, and EPA's toxic analyte list of 23 metals. Groundwater samples will be analyzed in the field for temperature, pH, and electrical conductivity.

Surface Water and Sediments

Reynolds Metals proposes to collect surface water samples at the following locations:

- From the outflow from Company Lake before it empties into the Columbia River to assess the quality of water flowing into the river from Company Lake.

- From the Columbia River near the Company Lake outfall to assess the water quality in the Columbia River downstream of the Company Lake discharge.

- From the Columbia River upstream of the Sandy River confluence to provide background river water quality data.

- From the eastern part of Company Lake to assess water quality away from the main inflow/outflow pattern in Company Lake.

- From Salmon Creek just downstream of the reported connection between the creek and the plant waste water collection ditch to assess possible impacts to the creek water quality.

Sediment samples will be collected from the following locations:

- From the Company Lake drainage ditch before it empties into the Columbia River to assess concentrations of sediments potentially entering the river.

- Two samples from the Columbia River, one east and one west of where the Company Lake discharge ditch enters the river, to assess sediment

concentrations near the Company Lake discharge. Two samples will be collected because of observed backwater flow patterns in the Columbia River at the Company Lake discharge.

- Two samples from the Columbia River upstream of the Sandy River confluence to provide background sediment quality data.

- Five samples from Company Lake, three in the eastern part of the lake to assess possible effects of the debris pile, one in the middle part of the lake, and one in the western part of the lake.

- Two samples from Salmon Creek, one just downstream of the possible connection with the plant waste water collection ditch and one near Reynolds Metals' property boundary.

In the SIP effort, all sample results for PCB analyses were qualified as rejected because of organic interferences. In this investigation, the samples will undergo a modified cleanup step in the laboratory in an attempt to obtain acceptable data.

Reconnaissance

Visual reconnaissance on foot and bicycle will be performed in accessible areas of the wooded floodplain area between the Columbia and Sandy Rivers. Stained and disturbed soil locations and unusual ground surface features will be documented. A minimum of one surface soil or product grab sample will be collected at each suspicious location.

Reconnaissance will be performed on the south and west boundaries of the south wetlands area with the intent of noting any cross drainages and/or any unmapped influent pipes, gates, overflows or structures. Any unusual features and/or sample locations which are noted during the reconnaissance will be marked and subsequently surveyed in.

In March 1994, 650 tons of soil containing Bunker-C fuel oil was excavated from the area northeast of the fuel tanks and disposed at the Waste Management facility in Arlington, Oregon. Diesel contamination was discovered below the excavated oil. Soil samples were collected and analyzed for TPH, PCBs, Volatile Organic Compounds and the toxicity characteristic leaching procedure for 8 metals. The oil contamination below the excavated soil was found to be diesel and heavy oil; no PCBs, VOCs or metals were detected.

Onsite Production Wells

The five production wells sampled during the EPA's site investigation will be resampled and analyzed for the same constituents as monitoring wells. Production well sampling will occur during the same sampling effort as the Phase 2 monitoring wells.

Surveying and Geographic Information System

Sample locations and elevations will be determined using standard survey techniques. Monitoring well elevations will be determined by differential levelling techniques using the WILD NA2 optical level. Vertical elevations will be referenced to National Geodetic Vertical Datum (NGVD) and will be accurate to 0.01 foot. A first-order control point has been identified near the site and the elevation datum has been transferred to the site.

All well locations and soil sample locations and elevations will be surveyed using either a WILD T1600 total station theodolite with a DI2000 EDM or a Trimble 4000 GPS system. Horizontal control has been established using the Trimble 4000 GPS system. Because it is not possible to survey all locations using GPS because of the tree cover north of the dike, some locations will require survey by manual techniques. Horizontal control will be referenced to State-Plane coordinates.

All horizontal and vertical coordinates for all wells and sampling locations will be stored in an electronic data package which is compatible with the existing GIS mapping for the Reynolds Metals Troutdale facility.

Air Sampling

As part of the site-specific health and safety plan, the following air monitoring equipment will be used during site activities:

- Flame ionization or photoionization organic vapor detector
- Hydrogen cyanide meter
- Combustible gas meter (invasive activities only)
- Oxygen meter (invasive activities only).

Fugitive dust emissions are not anticipated to be generated during site investigation activities, with the exception of test pits being excavated by backhoe. Each test pit and spoils pile will be sprayed with water periodically during excavation if dust is observed. In the unlikely event it will not be possible to prevent dust migration offsite during test pit excavation activities because of a combination of dry soil conditions and high wind velocities, perimeter air monitoring will be instituted.

4.3 Sample Types and Quantities

The proposed OU 1 assessment areas, other reconnaissance/assessment areas, the sample collection activities, the estimated number of samples, and the required QA/QC samples for each activity are listed in Table 4.

Table 4
Sample Locations and Quantities

Area	Activity	No. Composite Samples	Laboratory Composite Analysis	No. Discrete Samples	Laboratory Discrete Analysis	Comments
Soil Sampling						
Eastern Potliner	8 test pits	9	TPAH, PCB, CN	27	TBD	
Southern Potliner	11 test pits	13	TPAH, PCB, F, CN	34	TBD	11 composites analyzed for 13 metals
North Landfill SHN	4 test pits	4	TPAH, PCB, F, CN	10	TBD	3 composites analyzed for 13 metals
North Landfill EHW	3 test pits	3	TPAH, PCB, F, CN	9	TBD	2 composites analyzed for 13 metals
Scrap Yard	15 test pits	13	TPAH	40	TBD	3 composites analyzed for 13 metals
Parking Lot	4 geoprobe holes			12	TPAH, CN, PCB	
Cryolite Pond	6 hand auger holes	4	TPAH, PCB, CN	15	TBD	2 composites analyzed for fluoride
South Wetlands	5 hand auger holes	5	TPAH, PCB, CN, F, pesticides, TPH	10	TBD	
Stressed Veg.	2 hand auger holes	2	TPAH, PCB, CN, F, pesticides, 13 priority pollutant metals	4	TBD	
Reconnaissance Activities						
Soil/Product	Estimate 10	0	0	10	TBD	
Surface Water/Sediment						
Water	Company Lake, Columbia River, Salmon Creek	0	0	5	PAH, PCB, cyanide, fluoride, TAL metals	

Sediment	Company Lake, Columbia River, Salmon Creek	0	0	12	PAH, PCB, cyanide, fluoride, TAL metals	
Monitoring Well Installation and Sampling						
Soil	12 boreholes, 3 soil samples per borehole	0	0	36	PAH, PCB, TPH, cyanide, fluoride, TAL metals	Samples screened in laboratory for TPH, PCB, PAH. Fluoride, metals and cyanide are standard laboratory analysis. 10 percent of soil samples will be analyzed for TPH, PCB, and PAH to confirm data.
Water	12 wells	0	0	12	VOC, SVOC plus PAH, PCB, TPH, pesticides, cyanide, fluoride, TAL metals	
Production Wells						
Water	5 wells	0	0	5	VOC, SVOC plus PAH, PCB, TPH, pesticides, cyanide, fluoride, TAL metals	
TBD = To be determined						

4.4 Equipment Decontamination

Decontamination procedures will be generally consistent with those described in Appendix B of the Technical Assistance Team's Sampling Plan for the Reynolds Metals Troutdale Facility (E&E 1994). Geoprobe rods and drilling auger flights will be decontaminated with a pressure washer or steam cleaner and then air dried.

4.5 Investigation-Derived Wastes (IDW)

Disposable personnel protective equipment and sampling equipment will be bagged, drummed, labeled, and left onsite. Purge and decontamination water and drill cuttings will be drummed and left onsite. Field screening and laboratory waste will be segregated according to waste stream, drummed, and stored onsite. All IDW remaining onsite will be placed in a secure location until appropriate disposal is arranged.

4.6 Schedule of Activities

The proposed schedule of work is as follows:

Activity	Anticipated Level of Effort
Pre-mobilization, analytical setup	1 week
Site assessment activities	3 weeks
Analytical reporting	4 weeks
Data validation	4 weeks
Report generation	4 weeks

5.0 Quality Assurance/Quality Control Requirements

5.1 Analytical Parameters

The types of analyses required for the satisfactory completion of this project have been determined by the OSC. Analytical parameters are summarized by sample types and quantities in Table 5.

5.2 Quality Control Measures

Quality control checks for sample collection will be accomplished by a combination of collocated/replicate samples; background samples; rinsate blank samples; chain-of-custody protocols; and laboratory quality assurance.

Quality control measures for laboratory screening will include: collect and field analyze uncontaminated sample from site matrix to document matrix effect; for each batch of 20 samples, one blind duplicate will be analyzed to document method repeatability; on a daily basis, one extract spike on a sample previously determined to be below the lowest test level will be performed and analyzed; on a daily basis, a performance evaluation sample will be analyzed to document method/operator performance.

At least 10 percent of all of the samples analyzed by laboratory screening methods onsite will be submitted to the analytical laboratory for confirmatory analysis of the field screened analytes by an EPA-approved laboratory method. Samples submitted for confirmatory analyses will be selected to represent the response range of the field analyses (samples that tested below the lowest level, above the upper test level, and if applicable, between two test levels).

To assess the effectiveness of the decontamination procedures on the Geoprobe large bore sampler and the drill rig split spoon sampler, a final rinsate blank sample will be

Table 5
QA/QC Analysis and Objective Summary

Matrix*	Analytical Parameter	Analytical Method (ref)	Spikes		QA/QC	
			Matrix[1]	Surrogate[2]	Detect Limits[3]	DQO[4]
S SD	TPAH	CL–EPA 8270 SIM	10 ES 4/4	10 PE 34	10 ppm 1 ppm	QA-2
S SD	PCBs	CL–EPA 8080	10 ES 3/3	10 PE 24	1 ppm 0.5 ppm	QA-2
S SD	Cyanide	CL-EPA 335.2	17 4/4	10 PE NA	0.5 ppm 0.5 ppm	QA-2
S SD	Metals	CL–EPA 6010 CL–EPA 7470	37/37	NA	1 ppm 0.2 ppm	QA-2
S SD	Fluoride	CL–EPA 340.2	NA	NA	1 ppm	QA-2
W	SOC + all PAHs	CL–EPA 8270 SIM	3/3	25	same	QA-2
W	Cyanide	CL–EPA 335.2 Cl-335.1	3/3	NA	same	QA-2 QA-3
A	Inorganics PAHs, PCBs TSP	CL–EPA 6010A/7000 CL–EPA 8270A, 8310, 8080 FS–field method	3/3 3/3 NA	NA 140 NA	low conc.	QA-2

Notes:
*=Matrix: S = soil; W = water; O = oil; DS = drummed solids; DL = drummed liquids; TS = tank solids; TL = tank liquids; A = air; SD = sediments; X = other
1=Matrix Spike/Matrix Spike Duplicate: at a rate of 1 per 10 samples for QA 2 and 1 per 5 samples for QA 3. For laboratory screening the extract will be spiked.
2=1 for each sample for QA 2 and QA 3 (otherwise specify NA). PE = Performance Evaluation Sample–No surrogate required in screening analysis.
3=To be determined at the time that laboratory selection is made.
4=Data Quality Objective for analysis (enter QA 1, QA 2, or QA 3).
FS=Field Screening; ES = Extract Spike; CL = Commercial Laboratory; SOC = Synthetic Organic Compounds; IOC = Inorganic Compounds; SD = Sediment.

collected from each piece of equipment listed above at least once each day that sampling is being conducted.

5.3 Data Quality Assurance Review

The data validation review of data packages will include an evaluation of: the information provided on the analytical data sheets and required support documentation for all sample analyses; the supporting sample collection documentation, including chain-of-custody; and field instrument calibration and/or performance check documentation (if required by method). The QA review will also examine adherence to the procedures as described in the cited SOPs and the requested analytical methods.

6.0 Deliverables

Laboratory deliverables will be as specified in the Quality Assurance Objectives Section (Section 3.0), in ARC/INFO format.

Reynolds Metals' Project Manager will provide an interim update to the OSC within 2 weeks after the completion of the field work that will include preliminary data tables, a site map, and a verbal debriefing.

The Reynolds Metals Project Manager will provide a site assessment report within 12 weeks of project completion.

7.0 Data Validation

The data validation requirements for each DQO specified in Table 5 are included in the Interim Final Guidance for the Quality Assurance/Quality Control for Removal Activities (EPA, 1990c).